
Appendices

**Washington State
Draft Long Range Plan for
Amtrak *Cascades***

Appendix A

Amtrak Cascades Proposed Timetables and Project Implementation Schedule

Timetable A
Amtrak Cascades Intercity Passenger Rail Program

Southward Trains						Northward Trains				
109	107	105	103	101	Example Train Numbers	102	104	106	108	110
Stations										
6:05 P					Vancouver, BC	11:35 A				
7:37 P			8:35 A		Bellingham	9:49 A			9:05 P	
8:07 P			9:05 A		Mount Vernon	9:16 A			8:16 P	
8:51 P			9:53 A		Everett	8:36 A			7:36 P	
9:18 P			10:19 A		Edmonds	8:10 A			7:10 P	
10:00 P			11:00 A		Seattle	7:40 A			6:40 P	
	5:25 P	2:35 P	11:25 A	7:40 A			12:10 P	3:40 P	6:15 P	9:40 P
	5:36 P	2:46 P	11:37 A	7:51 A	Tukwila		11:41 A	3:11 P	5:46 P	9:11 P
	6:03 P	3:13 P	12:04 P	8:18 A	Tacoma		11:16 A	2:46 P	5:21 P	8:46 P
	6:40 P	3:50 P	12:40 P	8:55 A	Olympia/Lacey		10:38 A	2:08 P	4:43 P	8:08 P
	7:01 P	4:12 P	1:02 P	9:16 A	Centralia		10:18 A	1:48 P	4:23 P	7:48 P
	7:39 P	4:50 P	1:41 P	9:54 A	Kelso/Longview		9:37 A	1:07 P	3:42 P	7:07 P
	8:14 P	5:24 P	2:14 P	10:29 A	Vancouver, WA		9:03 A	12:33 P	3:08 P	6:33 P
	8:50 P	6:00 P	2:50 P	11:05 A	Portland, OR		8:45 A	12:15 P	2:50 P	6:15 P

Timetable A
Needed Projects, Service Goals, and Capital Costs

Project Improvement (Estimated Cost)*	Completion Year**	Service Goals			
		Total Daily Round Trip Trains	Schedule Running Time	Maximum Speed	Number of Trainsets
Seattle to Portland, OR Felida Crossover (\$2.2) Woodland Crossover (\$2.8) Titlow Crossover (\$4.0) Ruston Crossover (\$3.6) Sound Transit: Seattle to Lakewood Improvements (\$304.0)	3	4	3:25	79 mph	5
Seattle to Vancouver, BC Mount Vernon Siding (\$8.4)		2	3:55		

*In millions of 2006 U.S. dollars.

**The completion year assumes full funding for all capital projects and operations starting in 2002.

Note: At the time of this writing, the implementation of "gray shaded projects" have been identified by WSDOT as needed improvements that will be funded by other jurisdictions or agencies but are necessary to achieve WSDOT's goals for Amtrak Cascades service.

Timetable A General Location of Projects



Timetable B
Amtrak Cascades Intercity Passenger Rail Program

Southward Trains						Northward Trains							
109	111	107	105	101	103	Example Train Numbers		104	102	106	108	110	112
					Stations								
	6:00 P				7:10 A	Vancouver, BC			11:25 A			10:15 P	
	7:28 P				8:38 A	Bellingham			9:44 A			8:34 P	
	7:57 P				9:07 A	Mount Vernon			9:12 A			8:02 P	
	8:33 P				9:43 A	Everett			8:39 A			7:29 P	
	8:52 P				10:02 A	Edmonds			8:17 A			7:07 P	
	9:30 P				10:40 A	Seattle			7:55 A			6:45 P	
7:30 P		5:20 P	2:15 P	7:30 A	11:05 A				9:50 A		12:05 P	3:30 P	6:20 P
7:42 P		5:32 P	2:27 P	7:42 A	11:17 A	Tukwila		9:22 A		11:37 A	3:02 P	5:52 P	9:07 P
8:10 P		6:00 P	2:55 P	8:10 A	11:45 A	Tacoma		8:57 A		11:12 A	2:37 P	5:27 P	8:42 P
8:44 P		6:34 P	3:29 P	8:44 A	12:19 P	Olympia/Lacey		8:19 A		10:34 A	1:59 P	4:49 P	8:04 P
9:06 P		6:56 P	3:51 P	9:06 A	12:41 P	Centralia		8:00 A		10:15 A	1:40 P	4:30 P	7:45 P
9:44 P		7:34 P	4:29 P	9:44 A	1:19 P	Kelso/Longview		7:20 A		9:35 A	1:00 P	3:50 P	7:05 P
10:16 P		8:06 P	5:01 P	10:16 A	1:51 P	Vancouver, WA		6:47 A		9:02 A	12:27 P	3:17 P	6:32 P
10:50 P		8:40 P	5:35 P	10:50 A	2:25 P	Portland, OR		6:30 A		8:45 A	12:10 P	3:00 P	6:15 P

**Timetable B
Needed Projects, Service Goals, and Capital Costs**

Project Improvement (Estimated Cost)*	Completion Year**	Service Goals			
		Total Daily Round Trip Trains	Schedule Running Time	Maximum Speed	Number of Trainsets
Seattle to Portland, OR Vancouver Rail Project (\$86.6) Kelso to Martin's Bluff Rail Project (\$464.3) Centennial Crossovers (Leary and Pattison) (\$3.4) Winlock Crossover (\$3.4) Tenino Crossover (\$3.4) Ketron Crossover (\$3.4) North Portland Junction to Kenton (\$58.7)	5	5	3:20	79 mph	6
Seattle to Vancouver, BC Swift Customs Facility (\$13.8) Stanwood Siding (\$9.9) PA Junction/Delta Junction Improvements (\$34.4) Bellingham GP Improvements (\$2.3) Colebrook Siding (\$11.4)		2	3:55		

*In millions of 2006 U.S. dollars.

**The completion year assumes full funding for all capital projects and operations starting in 2002.

Note: At the time of this writing, the implementation of "gray shaded projects" have been identified by WSDOT as needed improvements that will be funded by other jurisdictions or agencies but are necessary to achieve WSDOT's goals for Amtrak Cascades service.

Timetable B General Location of Projects



Timetable C
Southward Trains Only
Amtrak Cascades Intercity Passenger Rail Program

Southward Trains										
115	111	117	109	113	105	103	107	101	Example Train Numbers	
								Stations		
		6:10 P		12:25 P			7:30 A			Vancouver, BC
		7:36 P		1:51 P			8:56 A			Bellingham
		8:04 P		2:19 P			9:24 A			Mount Vernon
		8:39 P		2:54 P			9:59 A			Everett
		8:58 P		3:13 P			10:18 A			Edmonds
		9:35 P		3:50 P			10:55 A			Seattle
7:40 P	6:20 P		2:10 P	4:05 P	9:55 A	8:10 A	11:10 A	6:30 A		
7:51 P	6:31 P		2:21 P	4:16 P	10:06 A	8:21 A	11:21 A	6:41 A		Tukwila
8:19 P	6:59 P		2:49 P	4:44 P	10:34 A	8:49 A	11:49 A	7:09 A		Tacoma
8:42 P	7:22 P		3:12 P	5:07 P	10:57 A	9:12 A	12:12 P	7:32 A		Olympia/Lacey
9:03 P	7:43 P		3:33 P	5:28 P	11:18 A	9:33 A	12:33 P	7:53 A		Centralia
9:40 P	8:20 P		4:10 P	6:05 P	11:55 A	10:10 A	1:10 P	8:30 A		Kelso/Longview
10:12 P	8:52 P		4:42 P	6:37 P	12:27 P	10:42 A	1:42 P	9:02 A		Vancouver, WA
10:40 P	9:20 P		5:10 P	7:05 P	12:55 P	11:10 A	2:10 P	9:30 A	▼	Portland, OR

Timetable C
Northward Trains Only
Amtrak Cascades Intercity Passenger Rail Program

Northward Trains									
Example Train Numbers	104	102	106	108	110	112	114	116	118
Vancouver, BC ↑		11:10 A		5:05 P		9:15 P			
Bellingham		9:31 A		3:26 P		7:36 P			
Mount Vernon		9:00 A		2:55 P		7:05 P			
Everett		8:28 A		2:23 P		6:33 P			
Edmonds		8:07 A		2:02 P		6:12 P			
Seattle		7:45 A		1:40 P		5:50 P			
	9:30 A		11:40 A	1:25 P	3:10 P	5:35 P	6:55 P	9:15 P	10:45 P
Tukwila	9:01 A		11:11 A	12:56 P	2:41 P	5:06 P	6:26 P	8:46 P	10:16 P
Tacoma	8:36 A		10:46 A	12:31 P	2:16 P	4:41 P	6:01 P	8:21 P	9:51 P
Olympia/Lacey	8:11 A		10:21 A	12:06 P	1:51 P	4:16 P	5:36 P	7:56 P	9:26 P
Centralia	7:52 A		10:02 A	11:47 A	1:32 P	3:57 P	5:17 P	7:37 P	9:07 P
Kelso/Longview	7:14 A		9:24 A	11:09 A	12:54 P	3:19 P	4:39 P	6:59 P	8:29 P
Vancouver, WA	6:42 A		8:52 A	10:37 A	12:22 P	2:47 P	4:07 P	6:27 P	7:57 P
Portland, OR	6:30 A		8:40 A	10:25 A	12:10 P	2:35 P	3:55 P	6:15 P	7:45 P

Timetable C
Needed Projects, Service Goals, and Capital Costs

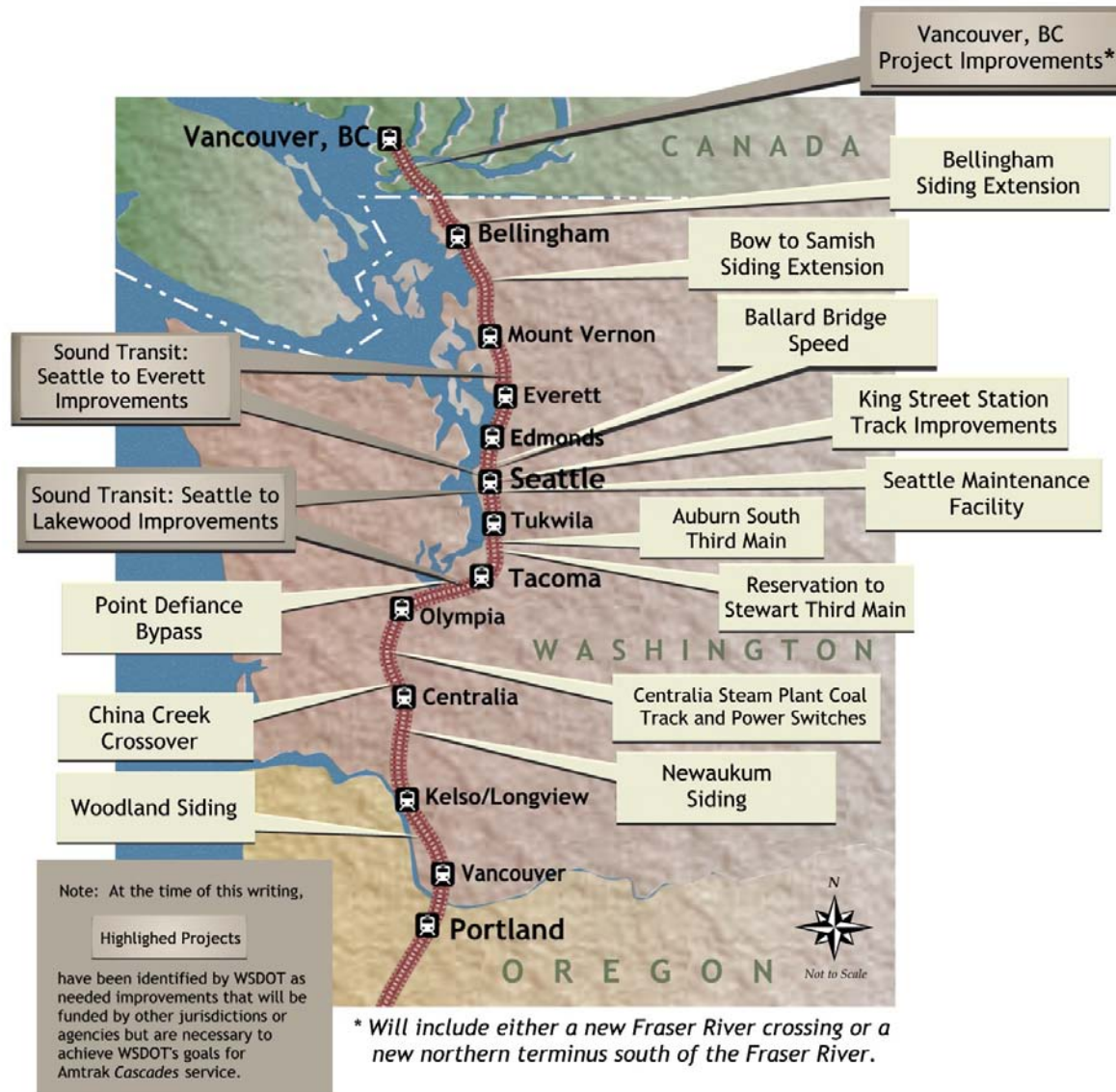
Project Improvement (Estimated Cost)*	Completion Year**	Service Goals			
		Total Daily Round Trip Trains	Schedule Running Time	Maximum Speed	Number of Trainsets
Seattle to Portland, OR King Street Station Track Improvements (\$92) Seattle Maintenance Facility (\$109) Point Defiance Bypass (\$412.0) Reservation to Stewart Third Main (\$48.3) Centralia Steam Plant Coal Track and Power Switches (\$6.1) Woodland Siding (\$15.3) Newaukum Siding (\$3.4) China Creek Crossover (\$1.7) Auburn South Third Main (\$23.9) Sound Transit: Seattle to Lakewood Improvements (\$160.0)	7 (Mid-point service)	8	3:00	79 mph	7
Seattle to Vancouver, BC Sound Transit: Seattle to Everett Improvements (\$207.0) Bow to Samish Siding Extension (\$50.5) Bellingham Siding Extension (\$102.6) Ballard Bridge Speed (\$11.5) Vancouver, BC Project Improvements (\$86.3-651.0)		3	3:25		

*In millions of 2006 U.S. dollars.

**The completion year assumes full funding for all capital projects and operations starting in 2002.

Note: At the time of this writing, the implementation of "gray shaded projects" have been identified by WSDOT as needed improvements that will be funded by other jurisdictions or agencies but are necessary to achieve WSDOT's goals for Amtrak Cascades service.

Timetable C General Location of Projects



Timetable D
Southward Trains Only
Amtrak Cascades Intercity Passenger Rail Program

Southward Trains											
119	121	117	113	111	115	109	105	103	107	101	Example Train Numbers
											Stations
	6:15 P				12:10 P				7:15 A		Vancouver, BC
	7:40 P				1:35 P				8:40 A		Bellingham
	8:09 P				2:04 P				9:09 A		Mount Vernon
	8:44 P				2:39 P				9:44 A		Everett
	9:03 P				2:58 P				10:03 A		Edmonds
	9:40 P				3:35 P				10:40 A		Seattle
7:30 P		5:20 P	2:35 P	1:30 P	3:55 P	12:00 P	10:00 A	8:30 A	11:00 A	7:00 A	
7:42 P		5:32 P	2:47 P	1:42 P	4:07 P	12:12 P	10:12 A	8:42 A	11:12 A	7:12 A	Tukwila
8:09 P		5:59 P	3:14 P	2:09 P	4:34 P	12:39 P	10:39 A	9:09 A	11:39 A	7:39 A	Tacoma
8:31 P		6:21 P	3:36 P	2:31 P	4:56 P	1:01 P	11:01 A	9:31 A	12:01 P	8:01 A	Olympia/Lacey
8:52 P		6:42 P	3:57 P	2:52 P	5:17 P	1:22 P	11:22 A	9:52 A	12:22 P	8:22 A	Centralia
9:27 P		7:17 P	4:32 P	3:27 P	5:52 P	1:57 P	11:57 A	10:27 A	12:57 P	8:57 A	Kelso/Longview
9:59 P		7:49 P	5:04 P	3:59 P	6:24 P	2:29 P	12:29 P	10:59 A	1:29 P	9:29 A	Vancouver, WA
10:25 P		8:15 P	5:30 P	4:25 P	6:50 P	2:55 P	12:55 P	11:25 A	1:55 P	9:55 A	▼ Portland, OR

Timetable D
Northward Trains Only
Amtrak Cascades Intercity Passenger Rail Program

Northward Trains											
Example Train Numbers	104	106	102	108	110	112	114	116	118	120	122
Vancouver, BC ↑			10:55 A	3:50 P				10:20 P			
Bellingham			9:17 A	2:12 P				8:42 P			
Mount Vernon			8:46 A	1:41 P				8:11 P			
Everett			8:13 A	1:08 P				7:38 P			
Edmonds			7:52 A	12:47 P				7:17 P			
Seattle			7:30 A	12:25 P				6:55 P			
	9:25 A	10:40 A		12:05 P	1:35 P	3:05 P	5:05 P	6:35 P	7:40 P	8:55 P	10:25 P
Tukwila	8:58 A	10:13 A		11:38 A	1:08 P	2:38 P	4:38 P	6:08 P	7:13 P	8:28 P	9:58 P
Tacoma	8:32 A	9:47 A		11:12 A	12:42 P	2:12 P	4:12 P	5:42 P	6:47 P	8:02 P	9:32 P
Olympia/Lacey	8:09 A	9:24 A		10:49 A	12:19 P	1:49 P	3:49 P	5:19 P	6:24 P	7:39 P	9:09 P
Centralia	7:50 A	9:05 A		10:30 A	12:00 P	1:30 P	3:30 P	5:00 P	6:05 P	7:20 P	8:50 P
Kelso/Longview	7:14 A	8:29 A		9:54 A	11:24 A	12:54 P	2:54 P	4:24 P	5:29 P	6:44 P	8:14 P
Vancouver, WA	6:42 A	7:57 A		9:22 A	10:52 A	12:22 P	2:22 P	3:52 P	4:57 P	6:12 P	7:42 P
Portland, OR	6:30 A	7:45 A		9:10 A	10:40 A	12:10 P	2:10 P	3:40 P	4:45 P	6:00 P	7:30 P

Timetable D
Needed Projects, Service Goals, and Capital Costs

Project Improvement (Estimated Cost)*	Completion Year**	Service Goals			Number of Trainsets
		Total Daily Round Trip Trains	Schedule Running Time	Maximum Speed	
Seattle to Portland, OR Winlock to Chehalis Third Main Track (\$149.9) Chehalis Junction Crossover (\$3.5) Chehalis Siding (\$11.3) East St. Johns Siding and Main Track Relocation (\$40.4) Lake Yard North Leads (\$26.0) Portland Union Station (\$7.6) Advanced Signal System - 110 mph (\$308.0)	13	10	2:55	110 mph	9
Seattle to Vancouver, BC None		3	3:25	79 mph	

*In millions of 2006 U.S. dollars.

**The completion year assumes full funding for all capital projects and operations starting in 2002.

Note: At the time of this writing, the implementation of "gray shaded projects" have been identified by WSDOT as needed improvements that will be funded by other jurisdictions or agencies but are necessary to achieve WSDOT's goals for Amtrak Cascades service.


Timetable D General Location of Projects



Timetable E
Southward Trains Only
Amtrak Cascades Intercity Passenger Rail Program

Southward Trains													
123	121	125	119	115	113	117	111	107	105	103	109	101	Example Train Numbers
													Stations
		5:40 P				12:20 P					7:05 A		Vancouver, BC
		7:05 P				1:45 P					8:30 A		Bellingham
		7:33 P				2:13 P					8:58 A		Mount Vernon
		8:08 P				2:48 P					9:33 A		Everett
		8:26 P				3:06 P					9:51 A		Edmonds
		9:05 P				3:45 P					10:30 A		Seattle
7:20 P	6:10 P		5:10 P	3:00 P	1:55 P	4:05 P	12:05 P	9:50 A	8:40 A	7:35 A	10:50 A	6:35 A	
7:31 P	6:21 P		5:21 P	3:11 P	2:06 P	4:16 P	12:16 P	10:01 A	8:51 A	7:46 A	11:01 A	6:46 A	Tukwila
7:59 P	6:49 P		5:49 P	3:39 P	2:34 P	4:44 P	12:44 P	10:29 A	9:19 A	8:14 A	11:29 A	7:14 A	Tacoma
8:20 P	7:10 P		6:10 P	4:00 P	2:55 P	5:05 P	1:05 P	10:50 A	9:40 A	8:35 A	11:50 A	7:35 A	Olympia/Lacey
8:39 P	7:29 P		6:29 P	4:19 P	3:14 P	5:24 P	1:24 P	11:09 A	9:59 A	8:54 A	12:09 P	7:54 A	Centralia
9:06 P	7:56 P		6:56 P	4:46 P	3:41 P	5:51 P	1:51 P	11:36 A	10:26 A	9:21 A	12:36 P	8:21 A	Kelso/Longview
9:37 P	8:27 P		7:27 P	5:17 P	4:12 P	6:22 P	2:22 P	12:07 P	10:57 A	9:52 A	1:07 P	8:52 A	Vancouver, WA
10:05 P	8:55 P		7:55 P	5:45 P	4:40 P	6:50 P	2:50 P	12:35 P	11:25 A	10:20 A	1:35 P	9:20 A	Portland, OR

Timetable E
Northward Trains Only
Amtrak Cascades Intercity Passenger Rail Program

Northward Trains													
Example Train Numbers	104	106	102	108	110	112	114	116	118	120	122	124	126
Vancouver, BC 			11:10 A		4:00 P				9:20 P				
Bellingham			9:31 A		2:21 P				7:41 P				
Mount Vernon			9:00 A		1:50 P				7:10 P				
Everett			8:27 A		1:17 P				6:37 P				
Edmonds			8:07 A		12:57 P				6:17 P				
Seattle			7:45 A		12:35 P				5:55 P				
	9:15 A	10:15 A		11:15 A	12:15 P	1:20 P	2:30 P	4:35 P	5:35 P	6:35 P	7:40 P	8:45 P	9:50 P
Tukwila	8:49 A	9:49 A		10:49 A	11:48 A	12:54 P	2:04 P	4:09 P	5:08 P	6:09 P	7:14 P	8:19 P	9:24 P
Tacoma	8:24 A	9:24 A		10:24 A	11:23 A	12:29 P	1:39 P	3:44 P	4:43 P	5:44 P	6:49 P	7:54 P	8:59 P
Olympia/Lacey	8:01 A	9:01 A		10:01 A	11:00 A	12:06 P	1:16 P	3:21 P	4:20 P	5:21 P	6:26 P	7:31 P	8:36 P
Centralia	7:42 A	8:42 A		9:42 A	10:41 A	11:47 A	12:57 P	3:02 P	4:01 P	5:02 P	6:07 P	7:12 P	8:17 P
Kelso/Longview	7:14 A	8:14 A		9:14 A	10:13 A	11:19 A	12:29 P	2:34 P	3:33 P	4:34 P	5:39 P	6:44 P	7:49 P
Vancouver, WA	6:42 A	7:42 A		8:42 A	9:42 A	10:47 A	11:57 A	2:02 P	3:02 P	4:02 P	5:07 P	6:12 P	7:17 P
Portland, OR	6:30 A	7:30 A		8:30 A	9:30 A	10:35 A	11:45 A	1:50 P	2:50 P	3:50 P	4:55 P	6:00 P	7:05 P

Timetable E
Needed Projects, Service Goals, and Capital Costs

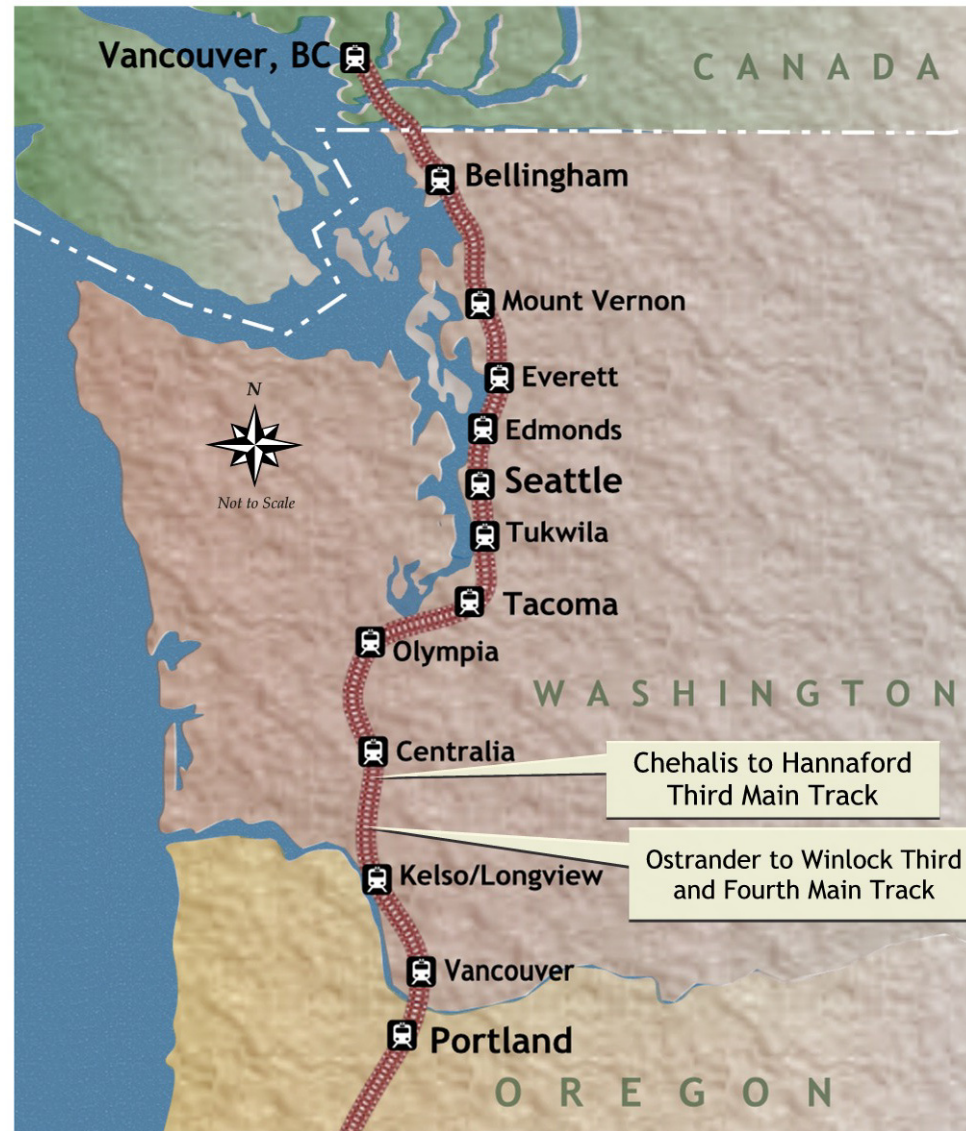
Project Improvement (Estimated Cost)*	Completion Year**	Service Goals			
		Total Daily Round Trip Trains	Schedule Running Time	Maximum Speed	Number of Trainsets
Chehalis to Hannaford Third Main Track (\$66.6) Ostrander to Winlock Third and Fourth Main Track (\$283.1)	15	12	2:45	110 mph	11
Seattle to Vancouver, BC None		3	3:25		

*In millions of 2006 U.S. dollars.

**The completion year assumes full funding for all capital projects and operations starting in 2002.

Note: At the time of this writing, the implementation of "gray shaded projects" have been identified by WSDOT as needed improvements that will be funded by other jurisdictions or agencies but are necessary to achieve WSDOT's goals for Amtrak Cascades service.

Timetable E
General Location of Projects



Timetable F
Southward Trains Only
Amtrak Cascades Intercity Passenger Rail Program

Southward Trains														
127	125	121	119	123	117	113	115	111	107	105	109	103	101	Example Train Numbers
														Stations
8:14 P				4:14 P			12:14 P				8:14 A			Vancouver, BC
9:07 P				5:07 P			1:07 P				9:07 A			Bellingham
9:27 P				5:27 P			1:27 P				9:27 A			Mount Vernon
9:59 P				5:59 P			1:59 P				9:59 A			Everett
10:17 P				6:17 P			2:17 P				10:17 A			Edmonds
10:51 P				6:51 P			2:51 P				10:51 A			Seattle
	8:06 P	6:06 P	5:06 P	7:06 P	4:06 P	2:06 P	3:06 P	12:06 P	10:06 A	9:06 A	11:06 A	8:06 A	6:06 A	
	8:18 P	6:18 P	5:18 P	7:18 P	4:18 P	2:18 P	3:18 P	12:18 P	10:18 A	9:18 A	11:18 A	8:18 A	6:18 A	Tukwila
	8:46 P	6:46 P	5:46 P	7:46 P	4:46 P	2:46 P	3:46 P	12:46 P	10:46 A	9:46 A	11:46 A	8:46 A	6:46 A	Tacoma
	9:05 P	7:05 P	6:05 P	8:05 P	5:05 P	3:05 P	4:05 P	1:05 P	11:05 A	10:05 A	12:05 P	9:05 A	7:05 A	Olympia/Lacey
	9:22 P	7:22 P	6:22 P	8:00 P	5:22 P	3:22 P	4:22 P	1:22 P	11:22 A	10:22 A	12:22 P	9:22 A	7:22 A	Centralia
	9:49 P	7:49 P	6:49 P	8:49 P	5:49 P	3:49 P	4:49 P	1:49 P	11:49 A	10:49 A	12:49 P	9:49 A	7:49 A	Kelso/Longview
	10:15 P	8:15 P	7:15 P	9:15 P	6:15 P	4:15 P	5:15 P	2:15 P	12:15 P	11:15 A	1:15 P	10:15 A	8:15 A	Vancouver, WA
	10:36 P	8:36 P	7:36 P	9:36 P	6:36 P	4:36 P	5:36 P	2:36 P	12:36 P	11:36 A	1:36 P	10:36 A	8:36 A	↓ Portland, OR

Timetable F
Northward Trains Only
Amtrak Cascades Intercity Passenger Rail Program

Northward Trains														
Example Train Numbers	104	102	106	108	110	112	114	116	118	120	122	124	126	128
Vancouver, BC ↑		9:22 A		1:22 P			5:22 P		8:22 P					
Bellingham		8:19 A		12:19 P			4:19 P		7:19 P					
Mount Vernon		7:56 A		11:56 A			3:56 P		6:56 P					
Everett		7:27 A		11:27 A			3:27 P		6:27 P					
Edmonds		7:07 A		11:07 A			3:07 P		6:07 P					
Seattle		6:45 A		10:45 A			2:45 P		5:45 P					
	8:30 A		9:30 A	10:30 A	11:30 A	12:30 P	2:30 P	4:30 P	5:30 P	6:30 P	7:30 P	8:30 P	9:30 P	10:30 P
Tukwila	8:07 A		9:07 A	10:07 A	11:07 A	12:07 P	2:07 P	4:07 P	5:07 P	6:07 P	7:07 P	8:07 P	9:07 P	10:07 P
Tacoma	7:42 A		8:42 A	9:42 A	10:42 A	11:42 A	1:42 P	3:42 P	4:42 P	5:42 P	6:42 P	7:42 P	8:42 P	9:42 P
Olympia/Lacey	7:20 A		8:20 A	9:20 A	10:20 A	11:20 A	1:20 P	3:20 P	4:20 P	5:20 P	6:20 P	7:20 P	8:20 P	9:20 P
Centralia	7:06 A		8:06 A	9:06 A	10:06 A	11:06 A	1:06 P	3:06 P	4:06 P	5:06 P	6:06 P	7:06 P	8:06 P	9:06 P
Kelso/Longview	6:37 A		7:37 A	8:37 A	9:37 A	10:37 A	12:37 P	2:37 P	3:37 P	4:37 P	5:37 P	6:37 P	7:37 P	9:37 P
Vancouver, WA	6:11 A		7:11 A	8:11 A	9:11 A	10:11 A	12:11 P	2:11 P	3:11 P	4:11 P	5:11 P	6:11 P	7:11 P	8:11 P
Portland, OR	6:00 A		7:00 A	8:00 A	9:00 A	10:00 A	12:00 P	2:00 P	3:00 P	4:00 P	5:00 P	6:00 P	7:00 P	8:00 P

Timetable F
Needed Projects, Service Goals, and Capital Costs

Project Improvement (Estimated Cost)*	Completion Year**	Service Goals			Number of Trainsets
		Total Daily Round Trip Trains	Schedule Running Time	Maximum Speed	
Seattle to Portland, OR Felida to MP 114 Third Main Track (\$173.1) Hannaford to Nisqually Third Main Track (\$512.5) Columbia River Bridge (joint Washington/Oregon project) (\$575.0)	20 (2023)	13	2:30	110 mph	12
Seattle to Vancouver, BC Marysville to Mount Vernon High-Speed Track (\$322.5) Burlington to Bellingham High-Speed Track (\$408.5) Bellingham to Blaine High-Speed Track (\$197.7) Everett Junction to Everett Second Main Track (\$22.9) Advanced Signal System - 110 mph (\$228.0) White Rock Bypass (\$312.7) Colebrook to Brownsville High-Speed Track (\$91.8)		4	2:37		

*In millions of 2006 U.S. dollars.

**The completion year assumes full funding for all capital projects and operations starting in 2002.

Note: At the time of this writing, the implementation of "gray shaded projects" have been identified by WSDOT as needed improvements that will be funded by other jurisdictions or agencies but are necessary to achieve WSDOT's goals for Amtrak Cascades service.

Timetable F General Location of Projects



Appendix B

Amtrak Cascades Service Alternatives

Amtrak *Cascades* Service Alternative and Fare Sensitivity Analysis

Service goals established for Amtrak *Cascades* in Washington are based on results from modeling work performed by the Washington State Department of Transportation and the United States Department of Transportation in the 1990s. These service goals include thirteen daily round trips between Seattle and Portland with a total travel time of two hours, thirty minutes and four daily roundtrips between Seattle and Vancouver, BC with a total travel time of two hours, forty minutes. These goals were chosen because the modeling data indicated that this level of service would provide the best mix of ridership, revenue, and cost. The long-range capital and operating plans included in this document are designed to achieve these service goals.

Operating cost data used in this updated long-range plan assumes that the fares for future Amtrak *Cascades* service will be essentially the same as the fares charged today. This fare structure is projected to reduce the subsidies necessary to operate the trains to approximately \$1.1 million per year, in 2003 dollars.

As part of this plan update, the project team examined the feasibility of adding more Amtrak *Cascades* trains to the daily schedule without adding any more infrastructure or equipment beyond that necessary to implement Timetable F. The project team also explored what would happen to ridership and revenues if fares were increased. This appendix describes the results of these analyses.

Additional Amtrak *Cascades* Service beyond Timetable F

WSDOT's long-range plan for Amtrak *Cascades* infrastructure construction is based on a series of six "building blocks" that could be introduced to the traveling public over time. These building blocks ultimately become the timetables that the traveling public will rely upon. In this plan, these six timetables are listed alphabetically as timetables A through F. A listing of these projects and their associated timetables are listed in **Appendix A**.

Train operation simulations performed for the last of these six timetables, Timetable F, revealed that additional daily service could be added to the rail line without requiring additional rail capacity or rail equipment. The simulations indicated that one additional daily round trip could be added between Seattle and Portland and one additional daily roundtrip could be added between Seattle and Vancouver, B.C. These additional daily roundtrips would be operated as a through train between Portland and Vancouver, B.C. **Exhibit B-1** on the following page presents a comparison of the ridership

projections, operating costs, and revenues between Timetable F and the Timetable F - Revised Service Plan that includes this additional service level.

Exhibit B-1
Comparison of Ridership Projections, Operating Costs, and Revenues

Schedule	Daily Roundtrips between Portland and Seattle	Daily Roundtrips between Seattle and Vancouver, B.C.	Total Annual Corridor Ridership	Total Annual Operating Expenses	Total Annual Operating Revenues	Total Annual Operating Balance
Timetable F	13	4	2,995,300	\$83,388,360	\$82,257,737	-\$1,130,623
Timetable F - Revised Service Plan	14	5	3,203,900	\$86,147,314	\$86,177,063	-\$30,251

All financial data is in 2003 dollars and assumes continuation of the current Amtrak Cascades fare structure.

Timetable F includes 3 daily roundtrips between Portland and Vancouver, B.C.

The Timetable F - Revised Service Plan includes 4 daily roundtrips between Portland and Vancouver, B.C.

Source: Amtrak Cascades Ridership and Revenue Forecasts Technical Report, 2004, and Amtrak Cascades Operating and Infrastructure Plan Technical Report, 2004.

The projections performed for the Revised Service Plan scenario indicate that Amtrak *Cascades* ridership would increase by 6.96 percent, expenses would increase by 3.30 percent, and revenues would increase by 4.76 percent. This would also result in a total operating subsidy reduction of 97.3 percent.

Amtrak Cascades Fare-Sensitivity Analysis

Fare sensitivity analyses estimate the affect of increasing rail fares on passenger travel choice. Throughout most of this plan, ridership and revenue projections assume that the existing Amtrak *Cascades* fare structure remains the same throughout the life of the program. As part of this plan update, the project team introduced higher fares at the service level mid-point (Timetable C), at the end of the capital program (Timetable F), and at Timetable F - Revised Service Plan described above. The results of this fare sensitivity analysis are listed in **Exhibit B-2**.

Exhibit B-2
Fare Sensitivity Analysis Projections

Schedule	Average One-Way Fare		Annual Ridership	Annual Revenues	Annual Operating Expenditures	Annual Operating Balance
	Seattle-Portland	Seattle-Vancouver, BC				
Timetable C	\$28	\$26	1,410,100	\$36,452,805	\$51,532,452	-\$15,079,646
Timetable C with 23% fare increase	\$34	\$32	1,246,900	\$39,861,663	\$50,825,126	-\$10,963,463
Timetable F	\$28	\$26	2,995,300	\$82,257,737	\$83,388,360	-\$1,130,623
Timetable F with 46% Fare Increase	\$40	\$38	2,516,600	\$88,790,000	\$81,298,647	\$15,297,339
Timetable F Revised Service Plan	\$28	\$26	3,203,900	\$86,117,063	\$86,147,314	-\$30,251
Timetable F - Revised Service Plan with 46% Fare Increase	\$40	\$38	2,696,900	\$106,332,057	\$83,906,352	\$22,425,706

Appendix B:

Amtrak *Cascades* Service Alternative Southbound Service 2023

129	127	125	123	121	119	117	115	113	111	109	107	105	103	101	Example Train Numbers	Stations
8:14 PM		4:14 PM		2:14 PM		12:14 PM			8:14 AM							Vancouver BC
9:04 PM		5:04 PM		3:04 PM		1:04 PM			9:04 AM							Bellingham
9:26 PM		5:26 PM		3:26 PM		1:26 PM			9:26 AM							Mount Vernon
9:56 PM		5:56 PM		3:56 PM		1:56 PM			9:56 AM							Everett
10:16 PM		6:16 PM		4:16 PM		2:16 PM			10:16 AM							Edmonds
10:51 PM	8:06 PM	6:51 PM	6:06 PM	4:39 PM	4:06 PM	2:39 PM	2:51 PM	2:06 PM	12:06 PM	10:51 AM	10:06 AM	9:06 AM	8:06 AM	7:07 AM	6:06 AM	Seattle
	8:17 PM	7:17 PM	6:17 PM	5:17 PM	4:17 PM	3:17 PM	2:17 PM	12:17 PM	11:17 AM	10:17 AM	9:17 AM	8:17 AM	7:18 AM	6:17 AM		Tukwila
	8:43 PM	7:43 PM	6:43 PM	5:43 PM	4:43 PM	3:43 PM	2:43 PM	12:43 PM	11:43 AM	10:43 AM	9:43 AM	8:43 AM	7:44 AM	6:43 AM		Tacoma
	9:04 PM	8:04 PM	7:04 PM	6:04 PM	5:04 PM	4:04 PM	3:04 PM	1:04 PM	12:04 PM	11:04 AM	10:04 10:05	9:04 AM	8:05 AM	7:04 AM		Centennial
	9:19 PM	8:19 PM	7:19 PM	6:19 PM	5:19 PM	4:19 PM	3:19 PM	1:19 PM	12:19 PM	11:19 AM	10:19 AM	9:19 AM	8:20 AM	7:19 AM		Centralia
	9:48 PM	8:48 PM	7:48 PM	6:48 PM	5:48 PM	4:48 PM	3:48 PM	1:48 PM	12:48 PM	11:48 AM	10:48 AM	9:48 AM	8:49 AM	7:48 AM		Kelso
	10:14 PM	9:14 PM	8:14 PM	7:14 PM	6:14 PM	5:14 PM	4:14 PM	2:14 PM	1:14 PM	12:14 PM	11:14 AM	10:14 AM	9:15 AM	8:14 AM		Vancouver, WA
	10:36 PM	9:36 PM	8:36 PM	7:36 PM	6:36 PM	5:36 PM	4:36 PM	2:36 PM	1:36 PM	12:36 PM	11:36 AM	10:36 AM	9:37 AM	08:36 AM	↓	Portland, OR

Appendix B:

Amtrak Cascades Service Alternative Northbound Service 2023

Example Train Numbers	102	104	108	110	112	114	116	118	120	122	124	126	128	130
Stations														
Vancouver, BC	9:22 AM	5:22 PM	1:22 PM				5:22 PM	8:22 PM						
Bellingham	8:16 AM	10:16 AM	12:16 PM				4:16 PM	6:16 PM						
Mount Vernon	7:55 AM	9:55 AM	11:55 AM				3:55 PM	5:55 PM						
Everett	7:24 AM	9:24 AM	11:24 AM				3:24 PM	5:24 PM						
Edmonds	7:06 AM	9:06 AM	11:06 AM				3:06 PM	5:06 PM						
Seattle	6:45 AM	08:30 AM 08:19 AM	10:30 AM 10:19 AM	11:19 AM	12:19 PM	1:19 PM	02:30 PM 02:19 PM	04:30 PM 04:19 PM	5:19 PM	6:19 PM	7:19 PM	8:19 PM	9:19 PM	10:19 PM
Tukwila		8:06 AM	10:06 AM	11:06 AM	12:06 PM	1:06 PM	2:06 PM	4:06 PM	5:06 PM	6:06 PM	7:06 PM	8:06 PM	9:06 PM	10:06 PM
Tacoma		7:39 AM	9:39 AM	10:39 AM	11:39 AM	12:39 PM	1:39 PM	3:39 PM	4:39 PM	5:39 PM	6:39 PM	7:39 PM	8:39 PM	9:39 PM
Centennial		7:19 AM	9:19 AM	10:19 AM	11:19 AM	12:19 PM	1:19 PM	3:19 PM	4:19 PM	5:19 PM	6:19 PM	7:19 PM	8:19 PM	9:19 PM
Centralia		7:03 AM	9:03 AM	10:03 AM	11:03 AM	12:03 PM	1:03 PM	3:03 PM	4:03 PM	5:03 PM	6:03 PM	7:03 PM	8:03 PM	9:03 PM
Kelso		6:36 AM	8:36 AM	9:36 AM	10:36 AM	11:36 AM	12:36 PM	2:36 PM	3:36 PM	4:36 PM	5:36 PM	6:36 PM	7:36 PM	8:36 PM
Vancouver, WA		6:10 AM	8:10 AM	9:10 AM	10:10 AM	11:10 AM	12:10 PM	2:10 PM	3:10 PM	4:10 PM	5:10 PM	6:10 PM	7:10 PM	8:10 PM
Portland, OR		6:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM

Appendix C

Washington State-owned Rail Equipment Preservation Plan and Replacement Options

**Washington State
Draft Long Range Plan for
Amtrak *Cascades***

Washington State-owned Rail Equipment Preservation Plan and Replacement Options

Pursuant to Revised Code of Washington (RCW) 47.06.090, the Washington State Department of Transportation (WSDOT) is required to identify any state-owned components of the department's passenger rail program and provide a long-term preservation plan for that equipment. The purpose of this requirement is to ensure that all state-owned rail equipment is properly preserved and maintained so that it lasts as long as possible before requiring replacement.

This appendix describes the current preservation plan for state-owned passenger rail equipment and provides an overview of Washington State's equipment replacement options for these trainsets.

Washington State-owned Passenger Rail Equipment

The Amtrak *Cascades* fleet that operates between Eugene, OR, Portland, OR, Seattle, Bellingham, and Vancouver, BC consists of five trainsets. Three of these trainsets are owned by the state of Washington. Amtrak owns the other two trainsets. Each trainset has seating capacity for approximately 250 passengers. Amtrak also owns seven locomotives used for the service, and Amtrak and the state of Oregon each own three cab control cars that are connected to the end of each trainset.¹

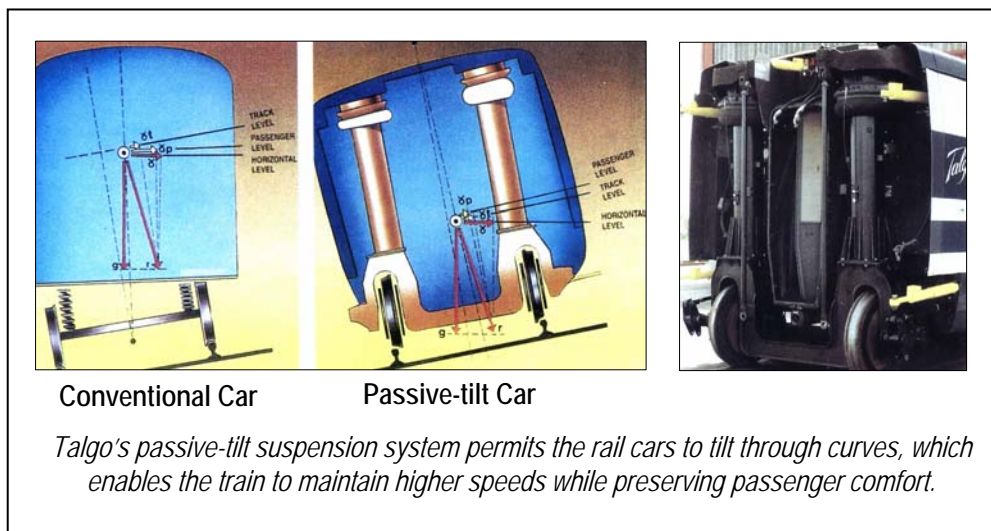
Each trainset includes twelve cars: six regular coaches, two business class coaches, one bistro car, one lounge car, one baggage car, and one generator car that powers heating, air conditioning, lights, kitchen equipment, and the train's video and audio system. Washington State also owns two additional cars: one baggage car and one generator car. These two cars, stored in Seattle, serve as spares and are only used when needed. Amtrak owns three additional cars: one spare bistro car stored in Seattle, and two coach cars that are used on their trainsets.

¹*Cab control cars are engineless locomotives placed at the end of each trainset that allow the engineer to operate the train from either end, eliminating the requirement to turn the entire trainset around after completing a route. This saves a significant amount of time and reduces the costs of operating the trains. Since the cab control cars were first put into service in 1999, the Federal Railroad Administration has issued an order that requires cab control cars on all Amtrak Cascades trainsets.*

Tilting Trainsets and the Pacific Northwest Rail Corridor

The Pacific Northwest Rail Corridor (PNWRC) has some extraordinary geographic characteristics that limit the capabilities of conventional train equipment. First constructed in the 1880s, over a quarter of the 466-mile long rail line is comprised of curves. Curves restrict the speed of conventional passenger equipment, and travel times between major cities could only be reduced by costly and time-consuming track relocation projects.

An alternative approach, identified through research conducted by WSDOT in the early 1990s, was to use “tilting” rail passenger equipment that could safely travel through curves at greater speeds than possible with conventional rail equipment. WSDOT leased European-manufactured trainsets in the mid 1990s to test this type of equipment in everyday service and determine its suitability and reliability in the Pacific Northwest’s unique rail environment. Patentes Talgo, S.A. of Madrid, Spain, manufactured this equipment. The Talgo trainsets performed well due to their rugged construction, lighter weight, and low center of gravity.



In 1995 the Washington State Legislature provided funding to lease/ purchase two tilting trainsets. WSDOT, in conjunction with Amtrak, issued a Request for Proposals (RFP) to lease/purchase four trainsets. The performance-based specifications included in this RFP led to the selection of Talgo as the manufacturer of the new trainsets sought by WSDOT and Amtrak. The two key factors that led to Talgo’s selection were the equipment’s demonstrated high service reliability and the fact that the Talgo tilting technology would not require additional testing or modification. The manufacturer-ready tilting technology not only reduced the construction and delivery time of the new trainsets, but also eliminated the need for numerous on-the-ground capital projects along the PNWRC that would have otherwise been necessary to

achieve the state's travel time goals between cities if non-tilting, conventional rail equipment had been purchased. WSDOT and Amtrak anticipated that the tilting suspension system would ultimately save tens of millions of dollars in publicly-funded capital construction throughout the rail corridor.

In 1997 partially constructed Talgo trainsets were sent via ship to the United States, with final assembly performed in Seattle by Pacifica Marine Inc. These trainsets went into service in January 1999.

Equipment Maintenance and Preservation

Talgo has been providing maintenance services on its trains for over forty years. As the manufacturer, they are uniquely suited to understand and conduct maintenance on the trainsets. Talgo's preventative maintenance philosophy—known as the Talgo Total Logistic Care System—is designed to ensure high reliability of the equipment through scheduled replacement of parts and constant monitoring of the performance of each trainset. This strategic maintenance program helps ensure the equipment's lowest-lifecycle cost, as Talgo's progressive maintenance schedule prevents the need for expensive repairs and greatly reduces the probability of major mechanical failures.

Under terms of the equipment maintenance agreements between WSDOT, Amtrak, and Talgo, each trainset is serviced on a regular basis at Talgo's maintenance facility near Safeco Field in Seattle. Talgo maintenance technicians (Amtrak employees under contract to Talgo) use a series of checklists to inspect and monitor the condition of vital components and ensure compliance with all safety rules. The results from these regular equipment checks are monitored and recorded, and the maintenance work identified through these inspections is then integrated into each Talgo trainset's regular maintenance schedule.

Talgo has an extensive, four-volume maintenance manual with specific maintenance schedules for the trainsets based on either mileage and/or time intervals. Each technician follows a specific inspection, repair, and replacement procedure as outlined by Talgo in the maintenance manual. These preventative maintenance procedures continue to keep the trainsets in excellent operating condition. In addition to this regular maintenance program, each Amtrak *Cascades* train has an onboard Talgo technician who constantly monitors the train's condition while it is in service. The technician can respond quickly to problems and even make some repairs while the train is en route, if necessary. Any problems detected by the onboard technician that cannot be immediately repaired are reported to the Talgo maintenance staff in Seattle, where they are addressed when the equipment arrives for its regularly scheduled servicing every four days.

How much does it cost WSDOT to maintain this equipment each year?

WSDOT's maintenance costs vary somewhat each year due to maintenance intervals for various items. The average cost to WSDOT is approximately \$2.29 million per year.

WSDOT's Maintenance Contract with Talgo: 2003-2007

	MONTHS	MONTHLY	ANNUALLY
July – December 2003	6	\$207,136	\$1,242,816
January – December 2004	12	\$187,035	\$2,244,420
January – December 2005	12	\$180,793	\$2,169,516
January – December 2006	12	\$184,949	\$2,219,388
January – July 2007	6	\$214,093	\$1,284,558
	48	Grand Total: \$9,160,698	

This maintenance contract does not include the third trainset purchased by WSDOT in late 2003. Maintenance costs for this trainset are paid by the state of Oregon.

Equipment Performance Measures

The WSDOT/Amtrak/Talgo maintenance agreement includes several performance measures that help WSDOT and Amtrak monitor how well the trainsets are functioning on a daily basis. It is imperative that the five trainsets used for Amtrak *Cascades* service are in good operating condition, as there are no spare trainsets available if the equipment cannot complete its scheduled route. If the trains are unavailable for any reason, it will have a significant impact on customer satisfaction, ridership, revenues, and the public's perception of the viability of rail service for intercity travel.

The most important of these equipment performance measures is the Reliability Failure Index. The Reliability Failure Index essentially measures the average number of miles traveled by the fleet of trainsets between major equipment failures.²

²The mathematical calculation used for the Reliability Failure Index equals the number of miles the fleet travels divided by the number of Mission Completion Failures (MCFs) plus two times the number of Mission Termination Failures (MTFs).

Talgo equipment performance requirements and penalties

Talgo is permitted one Mission Termination Failure (MTF) every 800,000 fleet miles.³ An MTF occurs when a mechanical component of the train fails en route and the train is either cancelled or is two or more hours late due to a Talgo train mechanical defect. The current accumulated fleet miles per calendar are approximately 680,000. As such, the Talgo fleet cannot have more than 0.85 MTFs a year without being assessed a financial penalty. In 2004, there were no MTFs.

Talgo is also permitted one Mission Completion Failure (MCF) every 200,000 fleet miles. An MCF occurs when a component of the train's mechanical system fails and either delays the train significantly or disrupts electrical power delivery to the train. Talgo is allowed three MCFs per year, based on current fleet usage. In 2004, there were four MTFs.

There are also lower order failures called Mission Success Failures (MSFs), which measure impacts to customer comfort items such as air conditioning, toilets, audio systems, and other customer amenities. These are also monitored and corrected by Talgo when they occur.

At the end of each calendar year, a team comprised of representatives from Amtrak, WSDOT, and Talgo conducts a performance review of the Talgo equipment. Mission Completion, Termination, and Success Failures are compiled and explained by Talgo management. Talgo can earn credits to offset the number of MTFs, MCFs, and MSFs each time Amtrak delivers the trainsets late from King Street Station for maintenance but Talgo is still able to get the trainsets back to Amtrak on time before its next scheduled departure. This gives Talgo a financial incentive to work diligently to correct any problems with the equipment in a timely manner. The review team subtracts any earned credits from the MTF, MCF, and MSF totals, up to a maximum of seven. Once the three parties comprising the review team agree to the final tally of mission failures, the financial penalties assessed to Talgo under the performance provisions of the WSDOT/Amtrak/Talgo maintenance agreement are recovered through a reduction in the monthly maintenance fees paid by WSDOT and Amtrak. The maintenance contract also contains a provision that if mission failures reach unacceptable levels, WSDOT and Amtrak can terminate the maintenance contract with Talgo and hire a new maintenance provider.

³*This calculation is based on four Talgo trainsets.*

When will the Talgo equipment be replaced?

WSDOT and Amtrak have not yet determined when the current fleet of Talgo trainsets will be replaced. The current fleet of trainsets that began service in 1999 has an anticipated life of twenty-five to thirty years, which means they will need to be replaced no later than 2029.

The decision to replace this equipment sooner than 2029 will be based on the availability of funding for rail line construction projects identified in WSDOT's long range plan for Amtrak *Cascades* and the ability of WSDOT and Amtrak to procure new train equipment at a reasonable price.

Equipment overhauls

The 2005 Washington State Legislature provided \$17 million for overhauls to the three state-owned trainsets. All three trainsets will receive interior and exterior improvements, including paint, seating, tables, carpet, toilets, windows, wall coverings, and video and audio systems. The overhauls will ensure that customer satisfaction and passenger comfort remains high during the life of the equipment. This overhaul work will be done in phases, starting in 2007 and ending in 2013.

Capital funding and incremental service additions

WSDOT's long-range plan for Amtrak *Cascades* service development is based upon incremental service additions and travel time reductions resulting from the completion of specific construction projects along the PNWRC. In 2005 the Washington State Legislature approved a ten year funding package for capital improvements to the PNWRC that will allow WSDOT to add one additional daily round trip between Seattle and Portland, OR in 2006, and set the stage for additional daily round trips with reduced travel times between these cities some time after 2015. This fourth daily round trip between Seattle and Portland, OR (Timetable A) will be the maximum level of service that can be accomplished with the existing five Talgo trainsets.

The next service increment identified in WSDOT's long-range plan calls for five round trips per day between Seattle and Portland and two round trips per day between Seattle and Vancouver, BC (Timetable B). This can only occur after completion of the Vancouver Rail Project (WA) and Kelso-Martin's Bluff Rail Project, the latter of which is not fully funded in the state's ten year transportation budget. If federal funding can be obtained to complete this project, and if there are sufficient operating funds to add the fifth daily round trip between Seattle and Portland, OR before the Talgo equipment reaches the end of its life, WSDOT and Amtrak will need one additional trainset to achieve the schedules that make up Timetable B. This means that a single

trainset will need to be added to the existing fleet of five trainsets or a minimum of six new trainsets will need to be purchased.

The current fleet of Talgo equipment is limited to a maximum speed of seventy-nine miles per hour (mph) on the PNWRC. The maximum train speeds for Timetable B and C is also seventy-nine mph. In Timetable D, 110 mph operations are introduced. With this higher speed requirement in mind, if there is additional funding provided to construct the projects necessary to achieve the schedules contained in Timetable C, seven trainsets capable of traveling at 110 mph will be necessary for daily operations.

The availability of high-speed rail equipment in the American marketplace

High-performance passenger train cars of any type, including high speed trains, are not readily available in the United States. Acela passenger equipment, developed specifically for use in Amtrak's Washington, D.C. to Boston Northeast Corridor (NEC) is the only other high speed equipment in use in the United States. Acela passenger rail equipment, designed for the unique characteristics of the NEC, is not well suited to any other rail corridor in the U.S.

Domestic rail transit and passenger car manufacturers are virtually non-existent because of the lack of demand for new passenger rail cars. Bombardier, a large Canadian transportation conglomerate, has some limited production facilities in Vermont, but for the most part, does the majority of its production outside the United States. European and Asian manufacturers have maintained production capabilities due to healthy international rail passenger equipment markets. However, most of these trains are not built to meet the regulations imposed by the U.S. Federal Railroad Administration, and therefore cannot be operated in this country without substantial modifications.

If additional high speed rail projects are funded throughout the U.S., there would likely be sufficient demand for new passenger equipment. As a result, domestic mass production could occur and it would be possible to buy equipment as needed. If WSDOT is the sole customer ordering high speed train equipment, the price will be significantly affected by the size of the order. Even an order for five trainsets (the size of the order for the current fleet of Amtrak *Cascades* trainsets) could be considered too small if a production facility in the U.S. needs to be established specifically for the order. An order for one trainset would likely receive no reasonably priced bids from rail equipment manufacturers.

Options for passenger rail equipment replacement

Based on the special market conditions described above, WSDOT's passenger rail equipment replacement options are as follows:

- WSDOT and Amtrak could continue to use the current fleet of Talgo equipment until the trainsets reach the end of their lifecycles, which under the current and anticipated service levels, is projected to be in 2029. This long-term use of the existing trainsets will only occur if there is insufficient funding to complete the capital projects necessary to go beyond five daily round trips between Seattle and Portland, OR and two daily round trips between Seattle and Vancouver, BC (Timetable A). After 2029, new equipment would need to be purchased.
- One additional trainset could be purchased for implementation of Timetable B, bringing the total number of trainsets to six. However, production of only one trainset would be extremely expensive and would likely be deemed cost-prohibitive for the state of Washington and Amtrak. (It is also unlikely that any manufacturer would offer to produce only one trainset.)
- If the U.S. federal government establishes a dedicated funding source that states can use for high speed rail development, WSDOT, Amtrak, and other organizations responsible for implementing intercity passenger rail service across the country could enter into a pool-agreement where one or more manufacturers would produce a large number of trainsets, thereby lowering the cost to all customers. WSDOT could purchase either six new trainsets for Timetable B, seven new trainsets for Timetable C, and potentially up to twelve new trainsets for Timetable F, which marks the completion of WSDOT's capital construction plan for Amtrak *Cascades* service in Washington. WSDOT's three existing Talgo trainsets could potentially be sold to other states or countries, and any funds generated through the sale of equipment could be applied toward other PNWRC capital expenses within Washington State or to offset the cost of this new train equipment.

Appendix D

Station Profiles

UNION STATION

Portland, Oregon

LOCATION

800 NW 6th Avenue, on the northern edge of Portland's downtown. The station is approximately 0.3 miles west of the Willamette River, between Chinatown and the Pearl District.

OWNER

The city of Portland

STATION PASSENGER VOLUMES

Approximately 500,000 Amtrak passengers passed through Portland's Union Station in 2005.



The Northern Pacific Terminal Company constructed the station in 1896. Since then, the station has hosted trains from the Northern Pacific, Great Northern, Southern Pacific, Portland, Spokane and Seattle, and Union Pacific Railways, as well as Amtrak.

In 1987, the Portland Development Commission acquired the station and began major restorations.



STATION AMENITIES

Amtrak ticket office and baggage service; QuikTrak automated ticket machine; snack bar and newsstand; ATM; public telephones; restrooms; full service restaurant. The facility meets the requirements of the American Disabilities Act.

PARKING SUPPLY

There are 25 on-street parking stalls adjacent to the station. The maximum time limit is one hour. In addition, there are 36 spaces across from the station available for \$3.50 per hour or \$9.00 per day. The lot also has two Flexcar stalls and three disabled parking stalls. A new, 400-stall Smart Park garage is two blocks north of the station. Rates are \$1.25 per hour, with a \$6.00 maximum for a 24-hour period.

Bicycle parking is limited to five bicycle posts near the entrance of the station.

STATION ACCESS

The station is located at the intersection of NW 6th Avenue and NW Irving Street. However, NW 6th Avenue is a transit only arterial, so travelers must either take SW Broadway to Irving Street or NW 4th Avenue to access the station. From the south, Interstate 405 Exit 2B leads to eastbound Everett Street, which intersects both Broadway and NW 4th Avenue. From the north, Interstate 5 exit 302A leads to the Broadway Bridge, NW Broadway, and NW Irving Street. Both freeways are less than a mile from Union Station.

STATION-AREA PLANS FOR DEVELOPMENT

The city of Portland has actively promoted higher density development in the vicinity of Union Station. Many new structures have been constructed within the past two years. The city of Portland has also explored relocating the Portland Post Office and using the site for a new baseball stadium.

CONNECTIONS TO OTHER MODES

Union Station is at the north end of Portland's Transit Mall. Tri-Met buses traveling south on 5th Avenue connect with other buses serving the greater Portland area, as well MAX, Portland's popular light rail system, which serves Hillsboro, Gresham, the Portland Exposition Center, and Portland International Airport. (Tri-Met intends to run light rail vehicles on the transit mall by 2009.) Portland's Greyhound terminal is one block south of Union Station. Amtrak Thruway bus service is available at Union Station, with connections to Astoria and Eugene. Tillamook Transit buses provide service between Union Station and Tillamook. The Portland Streetcar is four blocks west of Union Station. Taxis are available at the south side of the facility.



Union Station is circled in white. Source: The city of Portland

LOCAL POPULATION DATA

Residents within approximately five miles – 273,000; within approximately ten miles – 485,000; within approximately fifteen miles – 543,000.¹

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

The major structures near the station are the Post Office, the Broadway Bridge, and several multi-unit townhouses. The areas adjacent to Union Station are designated for commercial and residential uses.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Portland's Union Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Projected Passenger Volumes for Portland, OR

Timetable	Number of Passengers
C	712,000
F	1,458,000

¹The methodology used to produce these figures is not the same as that used for the other twelve stations listed in this appendix. These figures are from the city of Portland's Office and Transportation RTP_8 Model for the year 2000, which combines household data with travel patterns during an afternoon peak hour commute. Household data was then multiplied by the average number of residents (2.578) per household to produce the figures listed.

VANCOUVER STATION

Vancouver, WA

LOCATION

1301 West 11th Street, 0.7 miles west of downtown Vancouver. The station is located at the northern end of the railroad bridge that crosses the Columbia River.

OWNER

The city of Vancouver

STATION PASSENGER VOLUMES

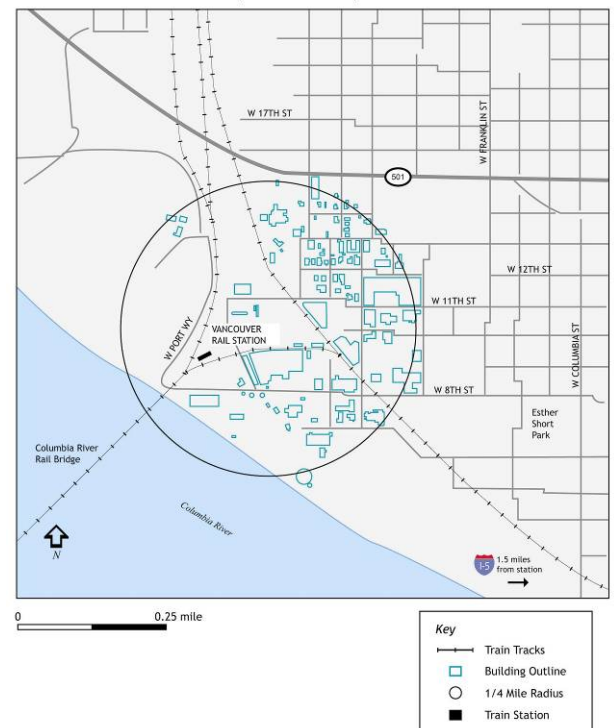
Approximately 72,000 passed through Vancouver Station in 2005.

The Spokane, Portland, and Seattle Railway constructed the station in 1908. The station opened upon completion of the Columbia River rail bridge that same year. Partial renovations were completed in 1988. In 2001, the city of Vancouver purchased the station from the BNSF Railway Company.

STATION AMENITIES

Amtrak ticket office and baggage service; QuikTrak automated ticket machine; public telephones; vending machines; restrooms; waiting area; meeting room. The facility meets the requirements of the American Disabilities Act.

Build Environment Near the Train Station
Vancouver Rail Station, Vancouver, WA



PARKING SUPPLY

There are 95 free automobile stalls at the station.

STATION ACCESS

The primary arterial serving the station is West 11th Street. Interstate 5 is approximately one mile east of the station. From the north, Interstate 5 exit 1C connects with State Route 501 (East 15th Street), Lincoln Avenue, and West 11th Street. From the south, Interstate 5 exit 1B connects East 6th Street, Jefferson Street, and West 11th Street.

CONNECTIONS TO OTHER MODES

There is no transit service available at the station. C-Tran buses are available at the 7th Street Transit Center. C-Tran provides free taxi vouchers to and from Vancouver Station from the 7th Street Transit Center. Local taxi service is available at the station.

LOCAL POPULATION CENSUS DATA

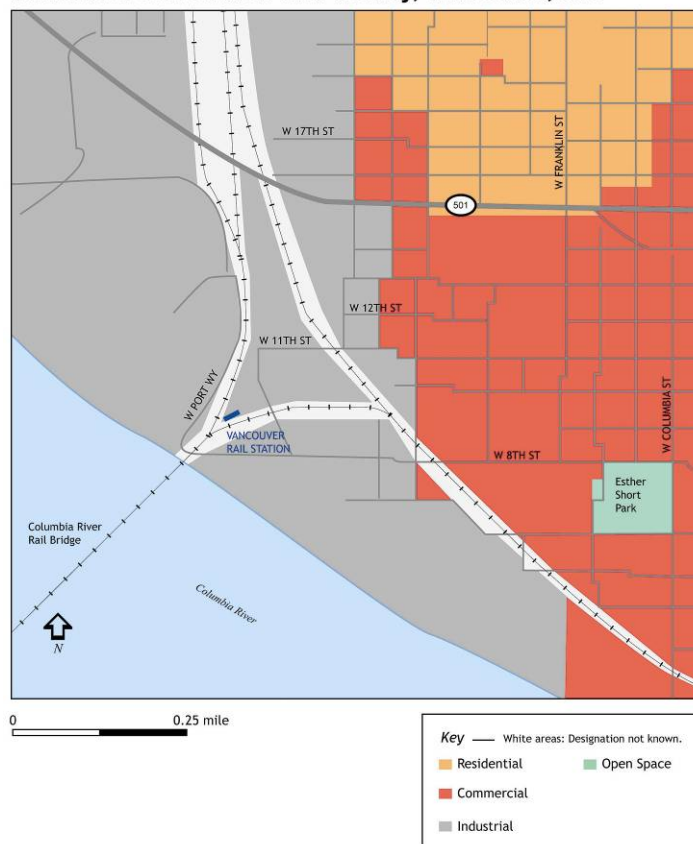
Residents within five miles – 175,000; within ten miles – 596,000; within fifteen miles – 820,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

There are currently many empty buildings in the immediate vicinity of the station, and the area is changing from a solely industrial neighborhood to one that encompasses a variety of uses and activities. Several lots in the area between the station and downtown are undeveloped. The area surrounding Vancouver Station is currently zoned heavy industrial, although it was historically a residential neighborhood. A short distance from the station, the land use designation transitions from industrial uses to the commercial downtown district. West of the station is a large parcel of land owned by the Port of Vancouver. The Port's land holdings stretch along the Columbia River and represent the most significant industry in the area, as well as one of the largest employers. At present, the adjacent land use pattern in the area remains heavy industrial, although the station's proximity to the commercial zone and to current downtown development projects places it in an area undergoing significant change.

Designated Land Uses

Vancouver Rail Station and Vicinity, Vancouver, WA



STATION-AREA PLANS FOR DEVELOPMENT

The city of Vancouver Economic Development Office intends to implement a long-range plan to revitalize the downtown area with new retail, commercial, and high-end residential properties, many of them mixed-use buildings.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Vancouver Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Projected Passenger Volumes for Vancouver, WA

Timetable	Number of Passengers
C	128,000
F	261,000

KELSO MULTIMODAL TRANSPORTATION CENTER

Kelso, Washington

LOCATION

501 South First Avenue, approximately 0.3 miles southwest of the center of Kelso's commercial business district. The station is three blocks south of the Allen Street Bridge, on the eastern shore of the Cowlitz River.

OWNER

The city of Kelso

STATION PASSENGER VOLUMES

Approximately 21,000 Amtrak passengers passed through the Kelso Multimodal Transportation Center in 2005.

The Northern Pacific Railway constructed the building in 1912. A \$3.4 million renovation of the facility was completed in 1995, using state and federal funds.

STATION AMENITIES

QuikTrak automated ticket machine; Greyhound ticket office; restrooms; telephones; vending machines; waiting area; public meeting space on the lower level. The facility meets the requirements of the American Disabilities Act.

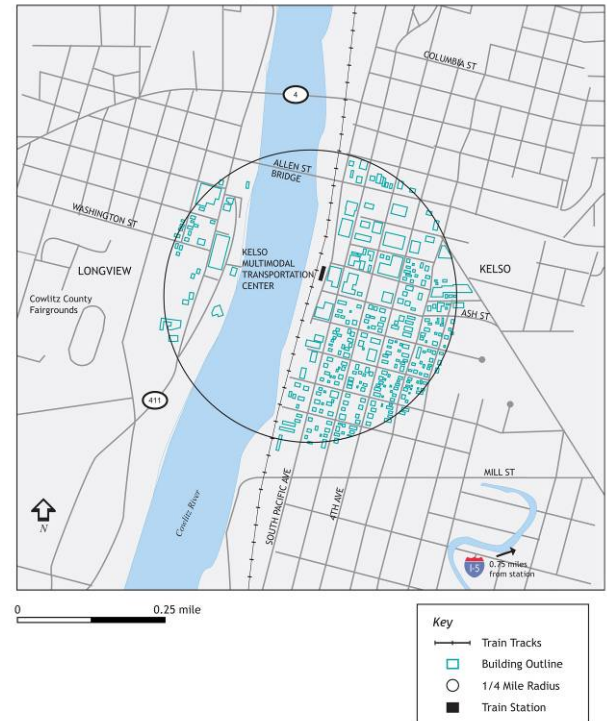
PARKING SUPPLY

There are 45 free automobile stalls at the station and eight bicycle lockers.

STATION ACCESS

Interstate 5 is approximately 0.75 miles east of the station. I-5 Exit 39 connects with Allen Street, Pacific Avenue, and Ash Street.

Built Environment Near the Train Station
Kelso Multimodal Transportation Center, Kelso, WA



CONNECTIONS TO OTHER MODES

Kelso's Greyhound terminal is located at the Kelso Multimodal Transportation Center. Community Urban Bus System (CUBS) service is available on the east side of the station. Local and regional taxis are also available.

LOCAL POPULATION CENSUS DATA

Residents within five miles – 60,000; within ten miles – 74,000; within fifteen miles – 82,000.

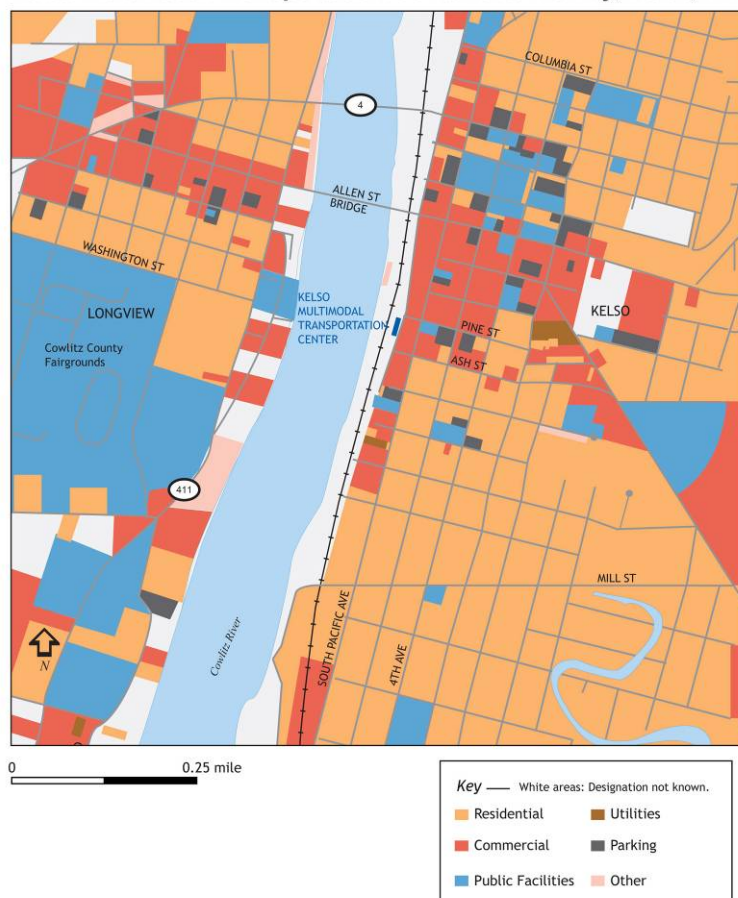
BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

Major structures near the station include the Kelso City Hall, the Allen Street Bridge, and several small businesses. The current land use for the surrounding area is a mix of retail, office, commercial, and high-density residential.

STATION-AREA PLANS FOR DEVELOPMENT

As part of a downtown revitalization effort, the city established a zoning overlay district in which new buildings, and renovations to existing buildings, in the downtown area must be “designed to reflect turn of the century (1900) western commercial structures.” The city of Kelso hopes these guidelines will help create a pedestrian-friendly downtown that is unique in comparison to the nearby Three Rivers Mall. New construction will reflect the city’s history and maintain the traditional block development pattern of the city.

Designated Land Uses
Kelso Multimodal Transportation Center and Vicinity, Kelso, WA



PROJECTED AMTRAK *CASCADES* PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at the Kelso Multimodal Transportation Center. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

**Projected Passenger
Volumes for Kelso, WA**

Timetable	Number of Passengers
C	53,000
F	107,000

UNION DEPOT

Centralia, Washington

LOCATION

210 North Railroad Avenue, in the heart of Centralia's commercial business district.

OWNER

The city of Centralia

STATION PASSENGER VOLUMES

Approximately 19,000 Amtrak passengers passed through Union Depot in 2005.

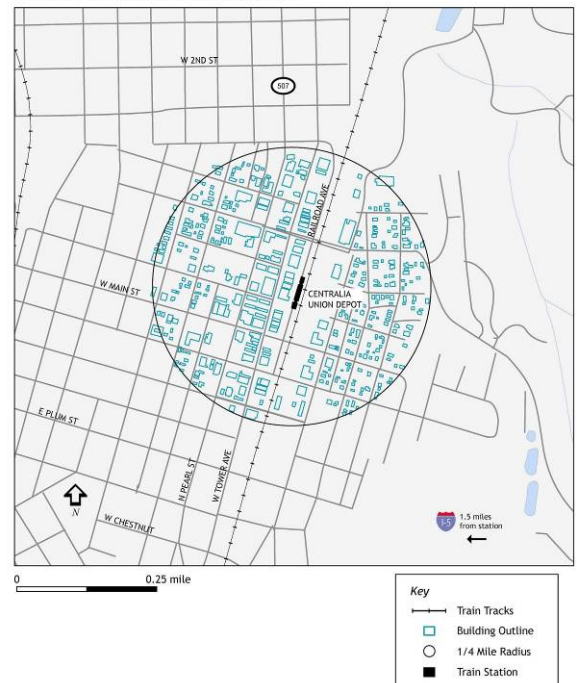
Centralia's Union Depot was constructed in 1912. The station has been renovated in phases, with the final phase completed in 2002. The state of Washington, the federal government, and the city of Centralia funded the \$4.7 million restoration project.

STATION AMENITIES

Amtrak ticket office and baggage service; public telephones; restrooms; vending machines; waiting area; banquet and meeting rooms; commercial office space.

The facility meets the requirements of the American Disabilities Act.

Built Environment Near the Train Station
Centralia Depot, Centralia, WA



PARKING SUPPLY

There are 96 free parking spaces at the station and in the immediate vicinity.

STATION ACCESS

North Railroad Avenue is one block east of Tower Avenue, a major one-way arterial that accommodates northbound traffic, and two blocks east of North Pearl Street, another major arterial that serves southbound traffic. Tower and Pearl are the bi-directional roadways that comprise State Route 507, which runs through Centralia. The station can be accessed from both roads

via Pine Street. Union Depot is approximately 1.5 miles east of Interstate 5. Exit 82 (Harrison Street) leads in to downtown, becomes Main Street, and intersects with North Railroad Avenue one block south of the station.

CONNECTIONS TO OTHER MODES

Twin City Transit, the area's public transit service, stops on the west side of Union Depot. Regional bus companies offer daily service to east Lewis County and Grays Harbor on the Washington Coast. Local taxis are also available.

LOCAL POPULATION CENSUS DATA

Residents within five miles – 25,000; within ten miles – 40,000; within fifteen miles – 58,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

Centralia's central business district, located one block from Centralia Union Depot, is made up of small specialty stores, restaurants, and antique shops. Sixty-seven properties in Centralia's Historic Downtown Business District, an area approximately six blocks long and three blocks wide, have been placed on the National Register of Historic Places. The area around the depot is zoned Core Commercial District (C-3) and the land use is primarily retail and residential. North and east of the depot, within a one-half mile radius, are vacant lots and some industrial uses.

STATION-AREA PLANS FOR DEVELOPMENT

In 2000, the city of Centralia adopted "Hospitality Centralia," a plan to re-establish Centralia as a "Hub City," a destination for small conventions, business meetings, seminars, entertainment, and recreation. A plan is well underway to redevelop Centralia's historic infrastructure to its original uses for hospitality, business conferences, entertainment, and commerce.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Centralia's Union Depot. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

**Designated Land Uses
Centralia Depot and Vicinity, Centralia, WA**



**Projected Passenger
Volumes for Centralia, WA**

Timetable	Number of Passengers
C	38,000
F	76,000

CENTENNIAL STATION

Olympia/Lacey, Washington

LOCATION

6600 Yelm Highway, 3.5 miles southeast of the center of Lacey and 7.8 miles southeast of the State Capitol in Olympia.

OWNER

Intercity Transit

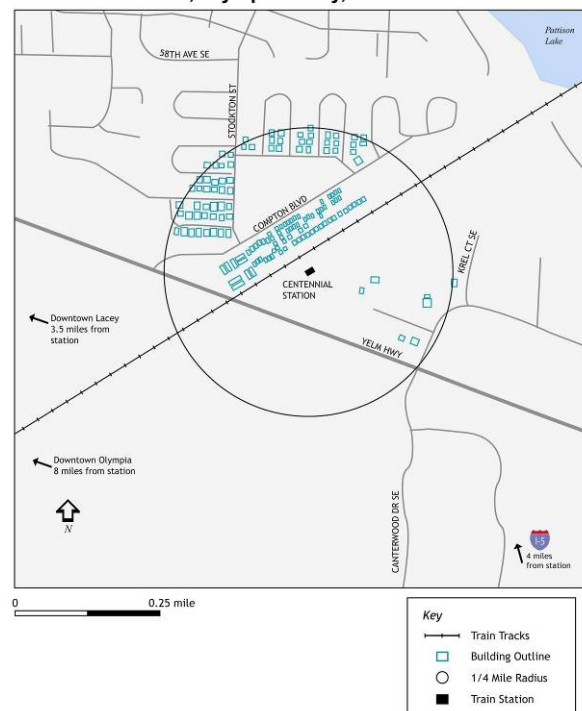
STATION PASSENGER VOLUMES

Approximately 42,000 Amtrak passengers passed through Centennial Station in 2005.

Centennial Station opened in 1992. The \$2.0 million facility was constructed with a combination of state, federal, and local funds, as well as donations of materials and labor by numerous businesses and citizens.

Centennial Station is the most remote of all Amtrak *Cascades* depots. The station is located at the intersection of Yelm Highway and the BNSF Railway Company main line. In the early 1900s, the Northern Pacific Railway (predecessors of the BNSF) constructed this main line from Tenino to the southeast shore of Puget Sound at Nisqually delta to avoid the steep grades of the original inland route constructed between Tenino and Tacoma in 1874.

Built Environment Near the Train Station
Centennial Station, Olympia/Lacey, WA



STATION AMENITIES

Restrooms; vending machines; telephones; a QuikTrak automated ticket machine; large waiting area. Volunteer staff are available to answer questions. The station also serves as an office for the Thurston County Sheriff.

PARKING SUPPLY

There are 136 free parking stalls at the station, including eight disabled parking stalls. There are also eight bicycle lockers on the north side of the station.

CONNECTIONS TO OTHER MODES

Intercity Transit offers hourly service to and from Centennial Station seven days a week. Local and regional taxis are also available.

STATION ACCESS

Yelm Highway is a major east-west roadway that connects south Olympia, Tumwater, and the south edge of Lacey with State Route 510 and Yelm. From points south of Olympia/Lacey, the station can be reached by taking Interstate 5 exit 101, Tumwater Boulevard, and Henderson Boulevard to Yelm Highway. Using this route, the station is approximately seven miles from the freeway. From points north, travelers can take Interstate 5 exit 109, College Way south to its intersection with Yelm Highway. Using this route, the station is approximately five miles from the freeway.

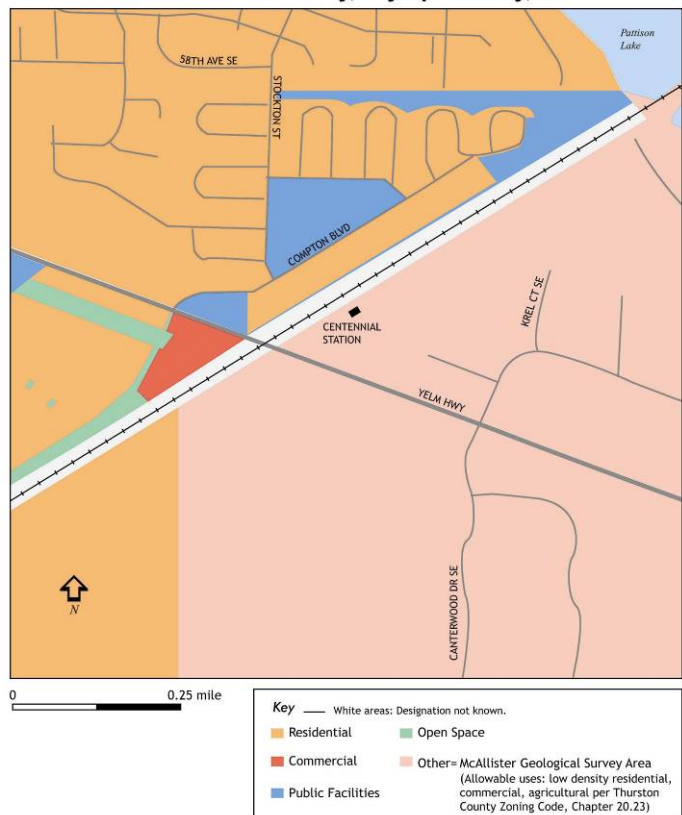
Local Population Census Data: Residents within five miles – 74,000; within ten miles – 133,000; within fifteen miles – 161,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

The station is just beyond the city of Lacey's urban growth boundary. To the northwest is a higher-density housing development. The other parcels adjacent to the facility are low-density residential and a large sod farm on the south side of Yelm Highway. The land on which the station is situated, and much of the land to the south, is within the McAllister Geologically Sensitive Area (MGSA), which allows only a base density of one residential unit per five acres.

Designated Land Uses

Centennial Station and Vicinity, Olympia/Lacey, WA



STATION-AREA PLANS FOR DEVELOPMENT

The MGSA land use designation, combined with the dense residential developments to the northwest of the station, greatly decreases the likelihood of any commercial development in the area.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Centennial Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Projected Passenger Volumes for Olympia, WA

Timetable	Number of Passengers
C	90,000
F	180,000

TACOMA AMTRAK STATION

Tacoma, Washington

LOCATION

1001 Puyallup Avenue, approximately 1.4 miles southeast of Tacoma's commercial business district and 0.5 miles east of Tacoma Dome Station, the city's major multimodal facility. Within the next 10 years, Amtrak *Cascades* trains will no longer stop at the Puyallup Street Station and instead relocate to Tacoma Dome Station.

OWNER

BNSF Railway Company

STATION PASSENGER VOLUMES

Approximately 102,000 Amtrak passengers passed through Tacoma's Amtrak Station in 2005.



The station was constructed in 1984 in response to the closure of Tacoma's Union Station, which has since become a Federal Courthouse.

STATION AMENITIES

Amtrak ticket office and baggage service; QuikTrak automated ticket machine; public restrooms and telephones; vending machines; waiting area. The facility meets requirements of the American Disabilities Act.

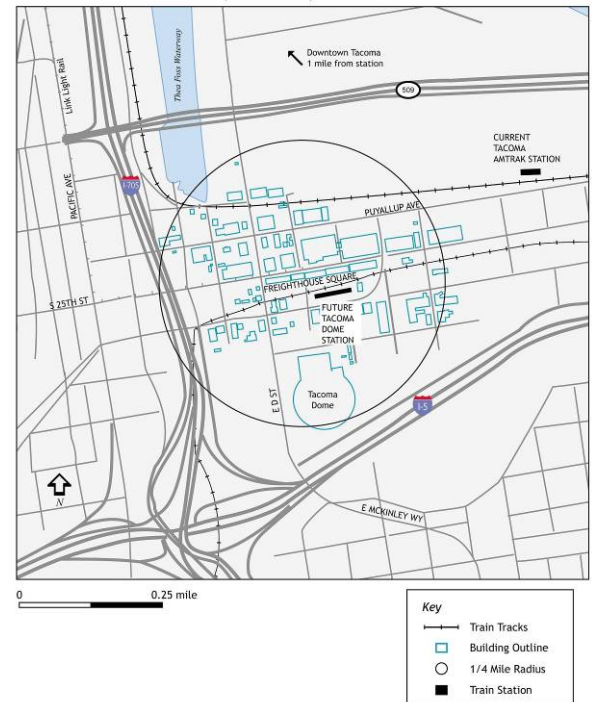
PARKING SUPPLY

There are 80 free parking stalls at Tacoma's Amtrak Station. There are also 2,400 free parking spaces at the Tacoma Dome Station three blocks to the west. There is no bicycle parking at Tacoma's Amtrak Station.

STATION ACCESS

The primary arterial serving Tacoma's Amtrak Station is Puyallup Avenue. Southbound Interstate 5 exit 135 connects with Portland Avenue and westbound Puyallup Avenue. To reach the station from northbound Interstate 5, travelers take exit 133 (Interstate 705 to City Center), then East 26th (Tacoma Dome), and D Street to eastbound Puyallup Avenue. Travelers coming from downtown Tacoma and the neighborhoods south of downtown can take Pacific Avenue to eastbound Puyallup Avenue.

Built Environment Near the Train Station
Tacoma Dome Station, Tacoma, WA



CONNECTIONS TO OTHER MODES

Amtrak's *Coast Starlight*, Pierce Transit, and Northwestern Trailways serve Tacoma's Amtrak station. The Tacoma Dome Station, three blocks to the west, has several other transportation connections including Greyhound, *Sounder* commuter rail, Link light rail, Sound Transit regional express buses, Pierce Transit, and Intercity Transit buses to Lacey and Olympia.

LOCAL POPULATION CENSUS DATA

Residents within five miles – 210,000; within ten miles – 553,000; within fifteen miles – 820,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

The current Puyallup Avenue facility is situated in an area zoned for industrial uses. To the north of the station is the Burlington Northern and Santa Fe Railway's rail yard and the 2,400 acre Port of Tacoma.

The land use designation around Tacoma Dome Station calls for mixed-use development. The city of Tacoma has designated this neighborhood as a primary growth area, defined as an area characterized by urban growth that has existing public facilities and service capacities to accommodate projected growth. At present, the land use pattern within one-half mile of Tacoma Dome Station is split among residential, industrial, and mixed uses.

**Designated Land Uses
Tacoma Dome Station and Vicinity, Tacoma, WA**



STATION-AREA PLANS FOR DEVELOPMENT

Future development around the existing Amtrak facility will continue to be industrial in nature. For the area around Tacoma Dome Station, the city of Tacoma has adopted the *Tacoma Dome Area Plan* that promotes a vision of mixed-use development to complement the public transit investments that have already been made. Anticipated developments for the Dome District include expansion of the Tacoma Dome Exhibition Center and the D Street grade separation and streetscape improvements.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Tacoma Dome Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

**Projected Passenger
Volumes for Tacoma, WA**

Timetable	Number of Passengers
C	197,000
F	402,000

TUKWILA STATION

Tukwila, Washington

LOCATION

7301 South 158th Street, approximately 0.7 miles east of the Southcenter Mall and four miles east of Sea-Tac International Airport.

OWNER

Sound Transit

STATION PASSENGER VOLUMES

Approximately 14,000 Amtrak passengers used Tukwila Station in 2005.

The temporary facility was constructed in 2001. It is comprised of two wooden platforms with shelters. The temporary facility is located on the site of the former Longacres Park racetrack.

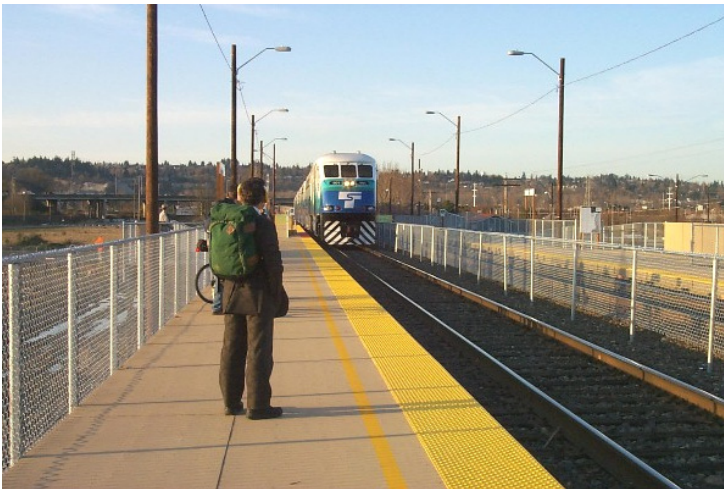
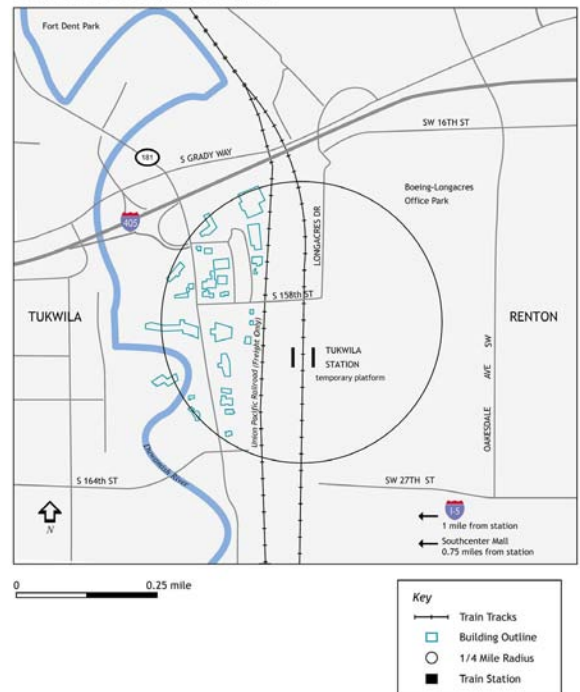
STATION AMENITIES

The temporary facility has no amenities. However the platforms do comply with the American Disabilities Act.

PARKING SUPPLY

There are 250 automobile/vanpool stalls on the east side of the station.

**Built Environment Near the Train Station
Tukwila Station, Tukwila, WA**



STATION ACCESS

Tukwila Station is approximately one mile east of Interstate 5 and 0.25 miles south Interstate 405. The station can be reached by taking Interstate 405 Exit 1, the West Valley Highway (State Route 181) 0.25 miles south to eastbound Longacres Way.

CONNECTIONS TO OTHER MODES

Sound Transit's *Sounder* commuter trains serve the station. Bus transit service at Tukwila station includes Metro and Sound Transit's regional express routes. Private taxis and shuttles are also available. There

is no public transit service between the station and Sea-Tac International Airport. It should be noted that Amtrak's *Coast Starlight* does not stop at Tukwila Station.

LOCAL POPULATION CENSUS DATA

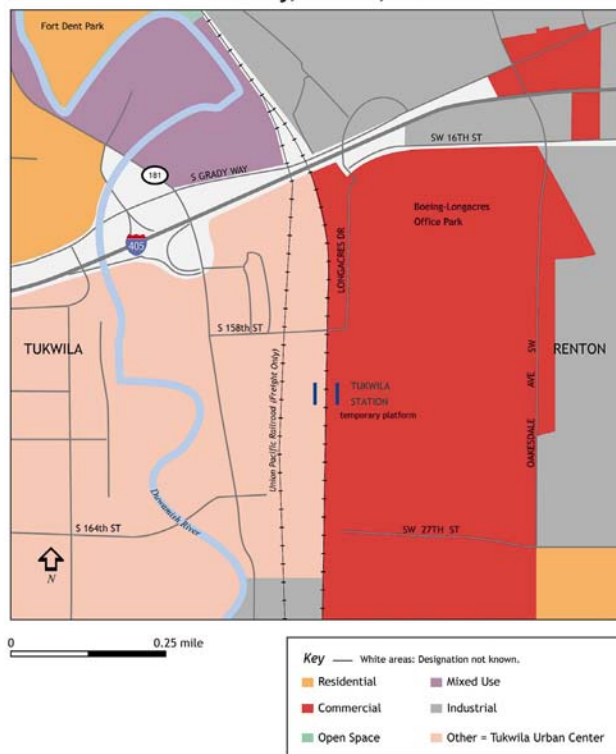
Residents within five miles – 223,000; within ten miles – 608,000; within fifteen miles – 1,112,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

Tukwila Station is located on the border of Tukwila and Renton, adjacent to the Boeing Longacres Office Park. The area around Tukwila Station is one of the largest undeveloped areas adjacent to any rail station in the state, although it is less than one mile from the heart of Tukwila's retail core. Nearby structures include the trestle for the Union Pacific Railroad and the Hampton Inn at the corner of Longacres Way and West Valley Highway.

The temporary Tukwila Station is included in the Tukwila Urban Center zoning designation, allowing a broad mix of commercial, office, light industry, warehousing, and retail uses. Although the area surrounding the station is not fully developed, the city of Tukwila established a moratorium in September 2002 on certain land divisions, development activities, and land uses in the proposed Transit Oriented Development (TOD) area surrounding the Tukwila Station. This TOD area lies between the West Valley Highway to the west and Tukwila city limits to the east.

Designated Land Uses
Tukwila Station and Vicinity, Tukwila, WA



STATION-AREA PLANS FOR DEVELOPMENT

Preliminary planning for a permanent facility in Tukwila is underway, but a number of other issues must be addressed and additional funding must be secured before final plans are completed. The cities of Tukwila and Renton are working together to extend and grade separate Strander Boulevard (just south of the station) and establish a link between the West Valley Highway and State Route 167. Relocating the Union Pacific Railroad's single track main line to the BNSF Railway Company's right-of-way (0.25 miles to the east) is also being considered so that more land is available for development adjacent to the new Tukwila Station. The station is tentatively scheduled to be completed in 2009-2010.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Tukwila Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Projected Passenger
Volumes for Tukwila, WA

Timetable	Number of Passengers
C	53,000*
F	140,000*

**It should be noted that the model used to develop these passenger volume projections used current passenger volumes at Tukwila Station. Neither WSDOT nor Amtrak have actively promoted Tukwila Station due to its lack of station amenities. Therefore, WSDOT believes these projections are extremely conservative.*

KING STREET STATION

Seattle, Washington

LOCATION

303 South Jackson Street, on the south edge of downtown Seattle. The station is 0.5 miles east of Puget Sound, between the International District and Pioneer Square.

OWNER

BNSF Railway Company

STATION PASSENGER VOLUMES

Approximately 650,000 Amtrak passengers passed through King Street Station in 2005.



The Great Northern Railway constructed King Street Station in 1906. The city of Seattle had originally intended to locate the station along the Seattle waterfront. The current location was selected after James J. Hill of the Great Northern Railway convinced the Seattle City Council that the waterfront properties would be better left for commercial development.

STATION AMENITIES

Amtrak ticket office and baggage service; QuikTrak automated ticket machine; public telephones; restrooms; vending machines; waiting area. The facility meets the requirements of the American Disabilities Act.

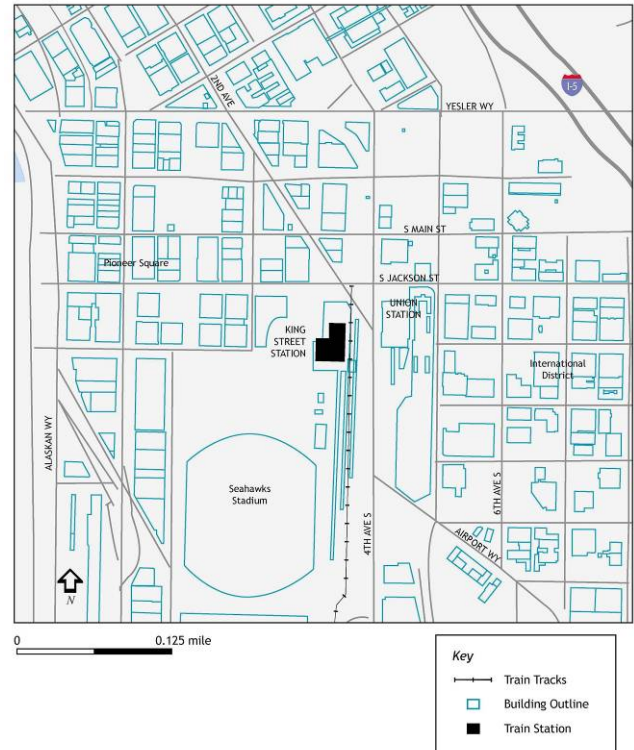
PARKING SUPPLY

Parking around King Street Station is somewhat limited. There is metered, on-street parking on King Street and Second Avenue South for \$1.50, with a two hour maximum. Day parking is available for a maximum of \$9.00 on non-event days in the parking lot just north of Qwest Field. Several other garages within three blocks of the station provide day and overnight parking that costs as much as \$20 per day; for these garages, travelers must check to ensure that the facility will be open if they are returning to Seattle after 7 p.m. There is no bicycle parking at King Street Station.

CONNECTIONS TO OTHER MODES

Transportation connections include Amtrak's long-distance *Coast Starlight* and *Empire Builder*, *Sounder* commuter trains, Northwestern Trailways and Olympic Bus Lines intercity buses, King County Metro, Sound Transit, Community Transit, and Pierce transit regional buses, Washington State Ferries (0.5 miles to the west), and the Waterfront Street Car (1 block northeast). Local and regional taxis are available on the west side of the station.

Built Environment Near the Train Station
King Street Station, Seattle, WA



STATION ACCESS

King Street Station is 0.5 miles west of Interstate 5 and 0.5 miles east of State Route 99. It is situated on the south edge of downtown and several of Seattle's major arterials lead to the station. For travelers coming from outside of downtown Seattle from the north, Interstate 5 exit 164 connects to Fourth Avenue South, Jackson Street, Second Avenue South, and King Street. From SR 99, the Safeco Field exit leads to Royal Brougham, Fourth Avenue South, Jackson Street, and Second Avenue South to King Street. From the east side of Lake Washington, travelers can take Interstate 90 to exit 1, which leads to the Fourth Avenue South approach to the station described above.



A conceptual drawing of the completed King Street Station renovations. Source: 2002 J. Craig Thorpe, commissioned by WSDOT.

LOCAL POPULATION CENSUS DATA

Residents within five miles – 378,000; within ten miles – 886,000; within fifteen miles – 1,381,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

King Street Station lies adjacent to the Chinatown/International District, the cultural center for the city's Asian-American community and historic Pioneer Square, the original business district of Seattle first established in 1852. Today, several large office buildings have been constructed to the east of the station. The other major structure is Qwest Field, an outdoor sports complex and exhibition center. The area to the west is zoned for mixed-use development with a 100-foot height limit. The majority of the other parcels adjacent to the station are zoned for commercial uses.

STATION-AREA PLANS FOR DEVELOPMENT

King Street Station is currently undergoing a \$17 million renovation, and plans have been developed for a second phase of improvements for the future King Street Transportation Center. Several development proposals are being considered for the areas around King Street Station. These include new office towers, condominiums and townhouses, parking structures, and some open space for parks and recreational uses. Construction is underway for Seattle's *Link* light rail system, which will run one block east of King Street Station.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at King Street Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Projected Passenger Volumes for Seattle, WA

Timetable	Number of Passengers
C	959,000
F	1,919,000

EDMONDS STATION

Edmonds, Washington

LOCATION

210 Railroad Avenue, between Edmond's downtown and waterfront.

OWNER

BNSF Railway Company

STATION PASSENGER VOLUMES

Approximately 28,000 Amtrak passengers passed through Edmonds Station in 2005.

The Great Northern Railway constructed this facility in 1956.

STATION AMENITIES

Amtrak ticket office and baggage service; restrooms; public telephones; vending machines. The facility meets the requirements of the American Disabilities Act.

PARKING SUPPLY

There are six short-term parking stalls for pick ups and drop offs, and approximately 210 longer-term parking stalls at the station available for \$12.00 per day. There is no bicycle parking at the station.

STATION ACCESS

The station is approximately four miles west of Interstate 5 and three miles west of State Route (SR) 99. From the south, I-5 exit 177 connects with SR 104. The station can be reached by taking SR 104 to Dayton or James Streets, both of which connect to the station's parking lot. From the north, I-5 exit 181 B connects with SR 524, which leads to the north entrance of the station at Main Street. From the west, the station can be reached by the Washington State Ferries' Edmonds to Kingston route.

CONNECTIONS TO OTHER MODES

Other transportation services at Edmonds Station include Amtrak's long-distance *Empire Builder*, *Sounder* commuter rail, Community Transit buses, and the Washington State Ferries. Local taxis and regional private van service are also available.

Built Environment Near the Train Station
Edmonds Station, Edmonds, WA



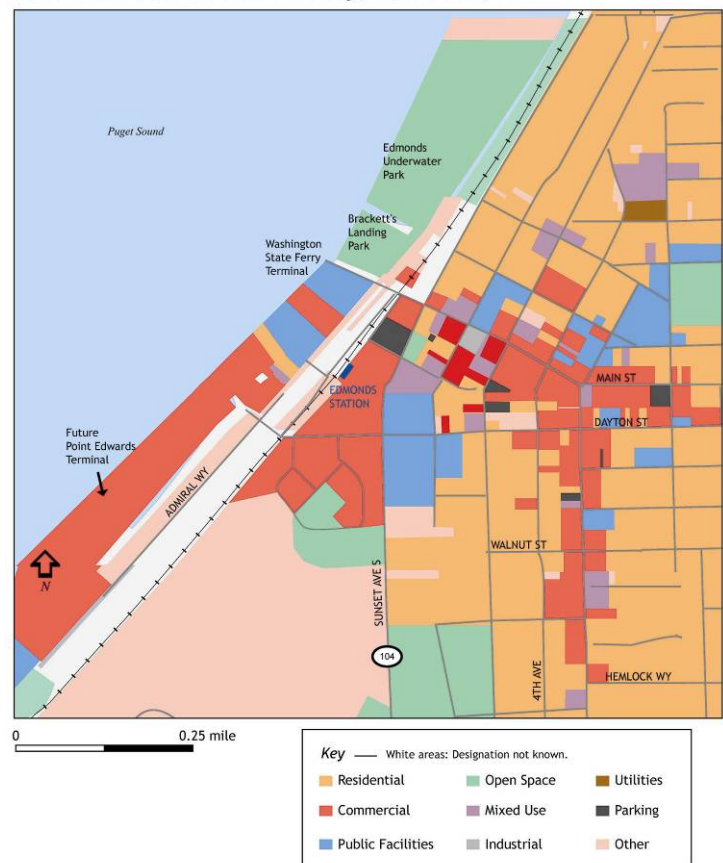
LOCAL POPULATION CENSUS DATA

Residents within five miles – 136,000; within ten miles – 505,000; within fifteen miles – 994,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

The lots adjacent to the station are paved parking lots, multi-family residential developments, and a mall with a large antique store and other small businesses. The tree-lined streets of the central business district, particularly Main Street, offer a mix of retail, office, commercial, and residential uses. The Port of Edmonds is located to the south of the station, and combines a mix of marina and boating services, a public promenade, and restaurants. Zoning designations in the station area are divided between Community Business, Commercial Waterfront, Public Use/Open Space, and Multi-Family Residential.

**Designated Land Uses
Edmonds Station and Vicinity, Edmonds, WA**



STATION-AREA PLANS FOR DEVELOPMENT

In 2012, construction of a new Washington State Ferries terminal in Edmonds is scheduled to begin. The scheduled completion date is set for 2017. The new \$122 million terminal, to be located approximately one mile south of the current ferry terminal, will initially serve ferry riders only. If additional funds can be secured for terminal expansion, Amtrak, Sound Transit, and other transportation providers will relocate to this facility.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Edmonds Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

**Projected Passenger
Volumes for Edmonds, WA**

Timetable	Number of Passengers
C	54,000
F	200,000

EVERETT STATION

Everett, Washington

LOCATION

3201 Smith Avenue, on the edge of Everett's commercial business district.

OWNER

The city of Everett

STATION PASSENGER VOLUMES

Approximately 39,000 people boarded and de-boarded Amtrak trains at Everett Station in 2005.



Photo Courtesy of the city of Everett

Everett Station opened in 2002. The \$45 million facility replaces the Amtrak depot formerly located on Bond Street. Funding for the new station came from the federal government, the state of Washington, Sound Transit, the city of Everett, and Amtrak.

STATION AMENITIES

Amtrak ticket office and baggage service; QuikTrak automated ticket machine; Greyhound ticket office; Everett Transit customer service office; coffee shop and espresso stand; public telephones; restrooms; waiting area; vending machines; banquet and meeting rooms; University Centers of North Puget Sound; Work Source Everett; public art

displays. The facility meets the requirements of the American Disabilities Act.

PARKING SUPPLY

There are 25 automobile stalls designated for Amtrak/Greyhound passengers, eight rideshare vehicle stalls, and six bicycle racks. There are 12 bus bays and four separate park and ride lots adjacent to the station with a total of 750 parking stalls.

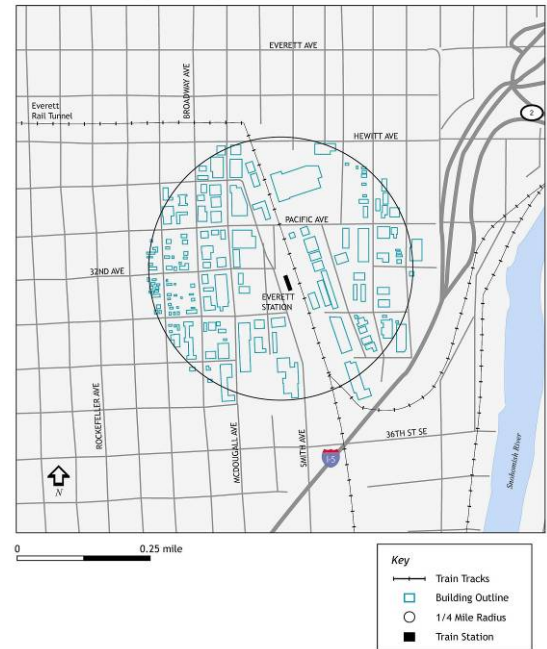
STATION ACCESS

Smith Avenue connects with Pacific Avenue, a major east-west arterial, just north of the station. Broadway, a major north-south arterial, is two blocks west of Smith Avenue. Pacific Avenue connects with northbound Interstate 5 exit 193. Travelers on southbound Interstate 5 use exit 194, Everett Avenue, and Maple Street to reach the station.

CONNECTIONS TO OTHER MODES

Everett Station transportation connections include Amtrak's *Empire Builder*, Greyhound, Northwestern Trailways, Sound Transit regional express buses, *Sounder* commuter rail, Everett Transit, and Community Transit. Local taxis and regional private van service are also available.

Built Environment Near the Train Station
Everett Station, Everett, WA



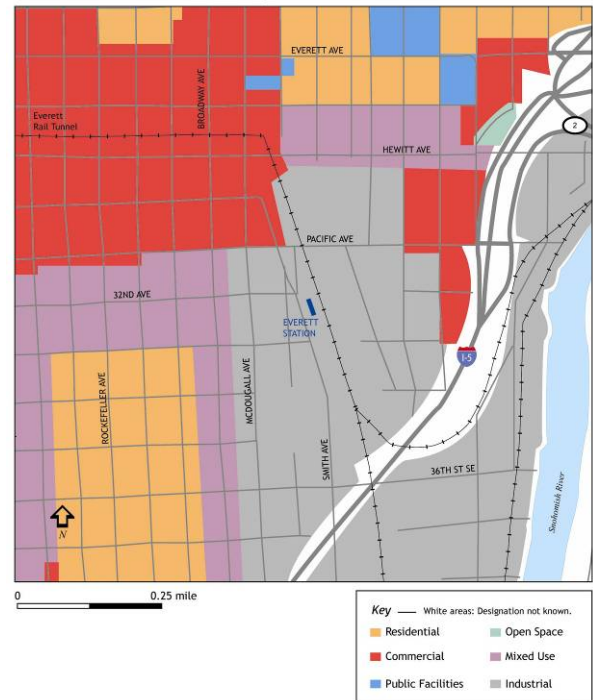
LOCAL POPULATION CENSUS DATA

Residents within five miles – 100,000; within ten miles – 240,000; within fifteen miles – 395,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

The station is located approximately 0.5 miles southeast of the city’s commercial business district. The area in the vicinity of Everett Station is primarily used for light industry, but is zoned to accommodate heavy commercial. The station itself sits in an industrial zone. As stated in the Everett Station Area Plan, the present land use pattern for the area is fragmented and includes a combination of commercial, retail, and industrial uses. The immediate surrounding area is made up of an overpass, parking facilities, light industrial buildings, such as Everett Iron and Metal Recycling Center, and commercial facilities, such as Lowe’s. East of the tracks, and visible from the station, is space available for lease.

Designated Land Uses
Everett Station and Vicinity, Everett, WA



STATION-AREA PLANS FOR DEVELOPMENT

The draft Station Area Plan includes development plans, including re-zoning of the area. The overall vision for the Everett Station area involves its evolution and enhancement as an employment center. This vision anticipates “flex tech,” a name for a location that provides easy access to transportation and allows for many different functions to occur within one building.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Everett Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Projected Passenger
Volumes for Everett, WA

Timetable	Number of Passengers
C	62,980
F	142,361

SKAGIT STATION

Mount Vernon, Washington

LOCATION

105 East Kincaid Street, on the edge of Mount Vernon's downtown commercial business district.

OWNER

Skagit Transit

STATION PASSENGER VOLUMES

Approximately 21,000 people boarded and de-boarded Amtrak trains at Skagit Station in 2005.

The new Skagit Station, completed in 2004, is near the site of the city's original Great Northern Railway depot. The \$7.7 million facility was constructed with funds from the federal government, the state of Washington, and local contributions.

STATION AMENITIES

Public restrooms; waiting area; community meeting space; the Mount Vernon Chamber of Commerce. The facility meets the requirements of the American Disabilities Act.

PARKING SUPPLY

There are ninety free parking stalls at the station, including four designated for disabled parking. There are also thirteen free on-street parking stalls adjacent to the station with a two hour limit. There is one bicycle rack that can accommodate as many as eight bicycles on the south side of the facility. The station also has a large area for Skagit Transit and Greyhound.

Built Environment Near the Train Station
Skagit Station, Mt. Vernon, WA



STATION ACCESS

Kincaid Street and West Montgomery Street are the primary arterials serving the Skagit Transportation Center. Kincaid Street intersects with Interstate 5 at Exit 226, approximately 0.2 miles east of the station.

CONNECTIONS TO OTHER MODES

Skagit Transit's downtown bus center is located at the Skagit Station. Mount Vernon's Greyhound depot is located at the station. Local taxis and regional private van service are also available.

LOCAL POPULATION CENSUS DATA

Residents within five miles – 36,000; within ten miles – 62,000; within fifteen miles – 95,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

Skagit Station is located next to the city's commercial business district, which includes offices, retail establishments, and government buildings. The designated lands uses include a mix of commercial, public facility, and industrial areas.

STATION-AREA PLANS FOR DEVELOPMENT

The city of Mount Vernon is exploring ways to support more development in its downtown core.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at the Skagit Station. The first is for

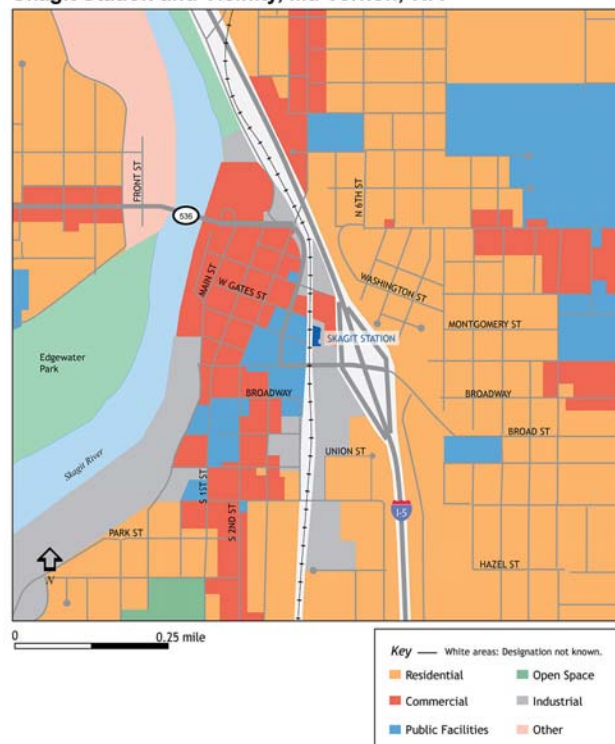
Projected Passenger Volumes for Mount Vernon, WA

Timetable	Number of Passengers
C	55,864
F	110,381

Timetable C, with a level of

service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Designated Land Uses
Skagit Station and Vicinity, Mt. Vernon, WA



FAIRHAVEN STATION

Bellingham, Washington

LOCATION

401 Harris Street, approximately 0.4 miles west of the Fairhaven Historic District and three miles south of downtown Bellingham.

OWNER

The Port of Bellingham

STATION PASSENGER VOLUMES

Approximately 56,000 people boarded and de-boarded Amtrak trains at Fairhaven Station in 2005.



Fairhaven Station was once the headquarters of the Pacific American Fisheries Company and underwent extensive renovations in 1994. The renovations cost approximately \$4.5 million, using a combination of state and local funds.

STATION AMENITIES

Amtrak ticket office and baggage service; QuikTrak automated ticket machine; Greyhound ticket office; coffee shop; vending machines; public telephones; restrooms; waiting area; commercial office space. The facility meets the requirements of the American Disabilities Act.

PARKING SUPPLY

There are eighteen automobile stalls, five bus bays, and eight bicycle lockers at the station. There are also 160 long-term parking stalls across the street from the station (\$6 per day, \$30 per week).

STATION ACCESS

Harris Avenue is the primary arterial serving Fairhaven Station. Finnegan Way connects downtown Bellingham and the Fairhaven Historic District, and Old Fairhaven Parkway connects with Interstate 5 at Exit 250, approximately 1.3 miles east of Fairhaven Station.

CONNECTIONS TO OTHER MODES

The Port of Bellingham's Fairhaven Cruise Terminal Complex is adjacent to the station. The complex is the southern terminus of the Alaska Marine Highway system. Private ferries at the cruise terminal also provide service to the San Juan Islands and Victoria, British Columbia. Bellingham's Greyhound depot is located at Fairhaven Station. Whatcom Transportation Authority buses stop on the south side of the station on Harris Avenue. Local taxis and regional private van service are also available.

Built Environment Near the Train Station Fairhaven Station, Bellingham, WA



LOCAL POPULATION CENSUS DATA

Residents within five miles – 62,000; within ten miles – 91,000; within fifteen miles – 113,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

Major structures within 0.25 miles of the station include the Fairhaven Cruise Terminal Complex, the Brenthaul Shipyards, and the Post Point Pollution Control Plant. The city's land use designations primarily support industrial and commercial activities.

STATION-AREA PLANS FOR DEVELOPMENT

The city of Bellingham and the Port of Bellingham are working together to develop lands adjacent to Bellingham Bay, including the Georgia Pacific plant along the downtown waterfront. The city is also making improvements to Boulevard Park, a popular recreation area approximately one mile north of Fairhaven Station. Commercial development is also occurring in the Fairhaven Historic District. Several parcels along Harris Avenue between the historic district and the train station remain undeveloped.

Designated Land Uses
Fairhaven Station and Vicinity, Bellingham, WA



PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Fairhaven Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Projected Passenger Volumes for Bellingham, WA

Timetable	Number of Passengers
C	118,012
F	265,637

PACIFIC CENTRAL STATION

Vancouver, British Columbia
Canada

LOCATION

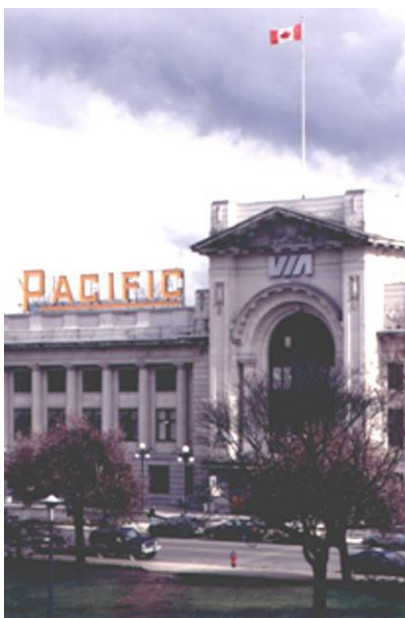
1150 Station Street, approximately 1.2 miles southeast of Vancouver's commercial center. The station is located at the intersection of the Strathcona, Mount Pleasant, and Downtown districts of the city.

OWNER

VIA Rail of Canada

STATION PASSENGER VOLUMES

Approximately 129,000 Amtrak passengers passed through Pacific Central Station in 2005.



The Canadian National Railway (CN) constructed Pacific Central Station in 1919. When Amtrak inherited the Great Northern Railway's *Pacific International* route between Seattle and Vancouver, in 1971, the railroad continued to use Pacific Central Station as its northern terminus. In the late 1980s, the station underwent an extensive renovation.

STATION AMENITIES

VIA/Amtrak ticket and baggage agents; Greyhound of Canada ticket agents; restaurant; gift shop; car rental agency; newsstand; currency exchange office; espresso bar; telephones; public restrooms; storage lockers; commercial office space. The station is wheelchair accessible.

PARKING SUPPLY

There are 21 short-term parking stalls at the station, including three disabled spaces. The stalls are metered and cost \$1.00 (CND) with a one hour maximum. The on-street parking supply near the station includes 19 metered spaces on the east side of Station Street with a two hour maximum (\$2.00 CND), and 20 un-metered stalls on the west side of Station Street. An additional 37 un-metered, on-street stalls with a two hour maximum are within a block of the station. Long-term parking for up to 20 automobiles is available at a private storage lot three blocks northwest of the station (on the corner of East 1st Avenue and Quebec Street) for \$12 (CND) per day. This lot is open 24 hours a day. There is no bicycle parking at the station.

STATION ACCESS

Station Street is parallel to and one block east of Main Street, a major north south arterial on the east edge of downtown Vancouver that connects the city's inner harbor, Chinatown, and the north shore of the Fraser River. The major east-west arterial north of the station is Hastings Street (Provincial Highway 7A), 0.5 miles to the north. The major east-west arterial south of the station is Broadway, (Provincial Highway 7), 0.7 miles to the south. The Trans-Canada Highway (Highway 1) is 3.1 miles east of the station, with ingress/egress at exits 25 (Hastings Street) and 28 (Boundary and Broadway).

CONNECTIONS TO OTHER MODES

Pacific Central Station transportation connections include VIA Rail, Greyhound of Canada, Pacific Coach Lines (to Victoria) and Vancouver's SkyTrain Expo line (Science World/Main Street Station). SkyTrain also provide connections to West Coast Express commuter trains and Vancouver's Seabus at the Waterfront Station. TransLink local and regional buses serve the station, as well local and regional private taxis.

LOCAL POPULATION CENSUS DATA

Residents within five miles – 665,000;
within ten miles 1,131,000; within
fifteen miles 1,550,000.

BUILT ENVIRONMENT AND DESIGNATED LAND USES ADJACENT TO THE STATION

Vancouver is one of the fastest growing cities on the west coast of North America. As a result, the areas adjacent to the station have been transformed from predominately industrial uses to high-rise residential and commercial uses. The City Gate development to the west of the station includes several new towers with townhouses and condominiums. Structures to the east of the station include the VIA Rail maintenance facility and a large rail yard for storing and assembling freight trains. The parcel to the north of the station (the former location of the Great Northern Railway terminal) is vacant. To the south is the SkyTrain's elevated guideway and several retail and light industrial structures.



Pacific Central Station is circled in white. Source: city of Vancouver

STATION-AREA PLANS FOR DEVELOPMENT

The city of Vancouver is exploring ways to further develop the area around the Pacific Central Station. Plans include a new hospital north of the station and new mixed-use development southeast of the station featuring commercial retail and housing.

PROJECTED AMTRAK CASCADES PASSENGER VOLUMES

WSDOT has made two projections for passenger volumes at Pacific Central Station. The first is for Timetable C, with a level of service that includes eight daily round trips between Seattle and Portland and three daily round trips between Seattle and Vancouver, BC. The second is for Timetable F, with a level of service that includes thirteen daily round trips between Seattle and Portland and four daily round trips between Seattle and Vancouver, BC.

Projected Passenger Volumes for Vancouver, BC

Timetable	Number of Passengers
C	294,000
F	711,000

Appendix E

Amtrak *Cascades* Northern Terminus Options

Amtrak *Cascades* Northern Terminus Options

In 1992, the United States Department of Transportation established the Pacific Northwest Rail Corridor (PNWRC). This corridor was selected as one of five corridors in the country to be developed for high speed rail service. The PNWRC stretches 466 miles (750 km), connecting Eugene, OR, Portland, OR, Seattle, Vancouver, BC, and twelve intermediate communities. In 1995, Amtrak, the Washington State Department of Transportation (WSDOT) and the BNSF Railway Company (BNSF) re-established passenger rail service between Seattle and Vancouver, BC. Since then, one daily round trip passenger train has continued to operate between these cities.

The northernmost station on the PNWRC is Vancouver, BC's Pacific Central Station. The station, located just southeast of the city's commercial business district, was constructed in 1919 by the Canadian National Railway (CN). When Amtrak inherited the Great Northern Railway's *Pacific International* route between Seattle and Vancouver, BC in 1971, the railroad continued to use Pacific Central Station as its northern terminus. Amtrak's *International* service was discontinued in 1981, and in the late 1980s, the station underwent an extensive renovation. In 1995, Amtrak and WSDOT returned to Pacific Central Station when the *Mount Baker International* was launched in May of that year.

In 2005, Pacific Central Station served over 129,000 Amtrak passengers. The station is also the western terminus of VIA Rail, Canada's national passenger rail service. Amtrak intercity buses, as well as local and regional transit, provide service at Pacific Central Station. SkyTrain, Vancouver's elevated rapid transit system, stops near the station and provides direct access to the Vancouver waterfront and over thirty transit centers throughout the greater Vancouver region.

The long-range plans for Amtrak *Cascades* service call for four daily round trips between Seattle and Vancouver, BC. To accommodate this level of service to Pacific Central Station, a number of major capital improvements need to be made to the rail corridor between the Fraser River and the downtown station. The cost of these projects, estimated at over \$500 million (USD), could preclude Amtrak *Cascades* service levels from increasing beyond two daily round trips between Seattle and Vancouver's Pacific Central Station, as it is uncertain if Canadian public funding for projects of this magnitude would ever be made available.

In the late 1990's the British Columbia Transportation Financing Authority commissioned a study to explore alternative routes for Amtrak *Cascades*

trains traveling to and from Vancouver, BC.¹ The study identified a possible alternative for the northernmost station stop for Amtrak *Cascades*. It was determined that a new station could be constructed on the south shore of the Fraser River, in Surrey, British Columbia, at a location known as Scott Road. This location is approximately ten miles (16 km) southeast of Pacific Central Station. The new station—referred to as the Greater Vancouver Terminal throughout this plan—would eliminate the need to construct a new Fraser River crossing (as a passenger service project) and other capital improvement between the river and downtown Vancouver. In 2002, the International Mobility and Trade Corridor Group (IMTC) included a preliminary feasibility assessment of the Greater Vancouver Terminal concept in its *Cascade Gateway Rail Study*.²

This appendix assesses the merits and demerits of continued use of Pacific Central Station and those of a new Greater Vancouver Terminal in Surrey, British Columbia.

What are the advantages of keeping the Amtrak *Cascades*' northern terminus at Pacific Central Station?

Pacific Central Station has two important attributes: proximity to downtown, and a well-established legacy as a major transportation hub for the city.

Proximity to downtown

Pacific Central Station is 1.25 miles (two kilometers) from the center of Vancouver's commercial business district and waterfront. The center of the city is a short taxi ride from the station, and easily accessible by transit, bicycle, and walking.



Downtown train stations can help serve as anchors for existing development and can help attract new businesses to the area. As passenger rail travel has become more popular in recent years, downtown train stations are being viewed as important community assets that can serve as catalysts for

¹*Route and Terminal Alternatives for Amtrak Passenger Train Service Between Vancouver and Seattle*. (1998). Prepared by Transit Safety Management for the British Columbia Transportation Financing Authority, Victoria, B.C., Canada.

²*Cascades Gateway Rail Study* (2002). Prepared by Wilbur Smith Associates for the International Mobility and Trade Group, Bellingham, Washington.

economic development and improved multi-modal connections. Examples include Portland's Union Station, Richmond, Virginia's renovated Main Street Station, Union Station in Meridian, Mississippi, and the Gateway Intermodal Transit Center in Los Angeles, California.

Well-established transportation hub with popular amenities

Pacific Central Station has been a major transportation hub for over eighty-five years. The station is well suited for rail passengers, with a variety of amenities including a currency exchange office, a rental car agency, a restaurant, a news stand, and easy access to local transit and taxis. The station also provides direct connections to Canada's transcontinental passenger trains, as well as regional intercity bus service that connect the station with communities across British Columbia.

What are the disadvantages of keeping the Amtrak *Cascades*' northern terminus at Pacific Central Station?

Cost

The primary disadvantage associated with the continued use of Pacific Central Station is the cost of the capital projects that must be completed to increase the service levels beyond two daily round trip Amtrak *Cascades* trains. The most expensive of these projects is a new bridge over the Fraser River. **Exhibit E-1** presents these estimated costs.

Exhibit E-1
British Columbia Infrastructure
Requirements Needed Before Mid-Point Service

Infrastructure Improvement	Estimated Cost
Alternative 1: Vancouver Central Station Terminus	
Fraser River Bridge Improvement	\$575 million
Brunette to Piper Siding	\$28.6 million
Sperling to Willingdon Junction	\$11.4 million
Still Creek to CN Junction	\$12.9 million
Vancouver Control System	\$6.9 million
Willingdon Junction	\$16 million
Alternative 2: Scott Road Terminus	
Scott Road Station	\$86.3 million

Source: Amtrak Cascades Capital Cost Estimates Technical Report 2004.

The current bridge was constructed in 1904, and its single track and slow speed limits severely limit rail line capacity. In addition to these limitations, the bridge includes a 380-foot swing span that allows Fraser River marine traffic to pass underneath the bridge. The span must be opened well in advance of approaching marine traffic, as the river channel is difficult to navigate near the bridge.

In addition to the Fraser River bridge replacement, four rail sidings or sections of additional main track and a new rail traffic control system will be necessary before the third and fourth Amtrak *Cascades* daily round trips can reach to downtown station. Due to the location of many of the piers that hold up the elevated SkyTrain system that parallels the tracks in many locations, the amount of space available for additional trackage may be limited and may prevent portions of it from being constructed.



The location of many SkyTrain piers may limit the amount of new tracks that can be constructed between the Fraser River and downtown Vancouver, BC.

It should also be noted that while the combination of the new Fraser River bridge and the additional sidings would increase rail line capacity and schedule reliability, the over \$500 million investment would do little to reduce travel times between Pacific Central Station and the Fraser River, as the soils and wetlands in the area will always preclude faster speeds for both passenger and freight trains.

Ridership

Population is no longer concentrated exclusively in central urban areas as it was when most of the great central-city stations were built. The suburbs often represent the preponderance of the population of a metropolitan area. For that reason, the schedules of corridor and long distance passenger trains often include a suburban stop in addition to a central city terminal. For example:

- Boston (Route 128, Woburn);
- New York (Croton-Harmon, Yonkers);
- Washington, DC (New Carrollton);
- Chicago (Glenview, Naperville, Joliet, Homewood, Hammond);
- Los Angeles (Fullerton);
- Seattle (Tukwila, Edmonds);
- Toronto (Oakville, Malton); and
- Montreal (Dorval, Saint-Lambert).

The ridership research conducted by WSDOT indicates that a suburban terminal in lieu of a city-center terminal (under a set of specific conditions) supports greater ridership when only one of the two is possible.

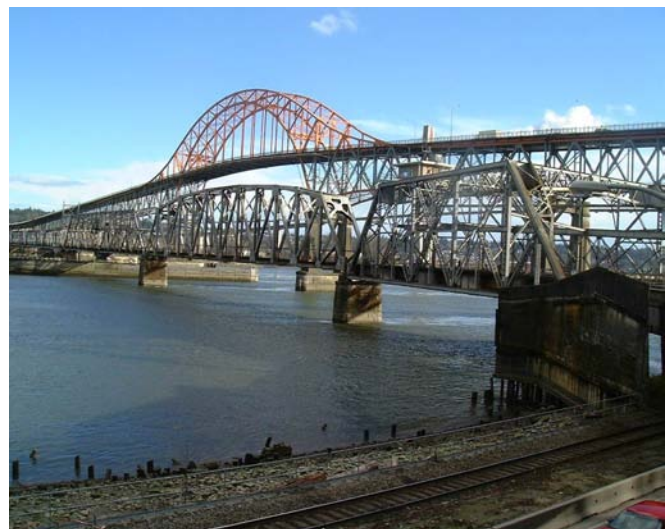
What are the advantages of relocating the Amtrak *Cascades*' northern terminus to Surrey, British Columbia?

A new Greater Vancouver, BC Terminal would avoid the chokepoint that currently exists at the Fraser River crossing and eliminate the requirement that the bridge be modified or replaced before more Amtrak *Cascades* passenger trains can be added. In addition, the new regional terminal could be more attractive to area residents, as the station would be more centrally located and more accessible for a greater number of people. The new station could also support new development plans that have been proposed by the Planning and Development Department of the city of Surrey.

Avoiding the bridge and avoiding potential tolls

In 2004, the Greater Vancouver Gateway Council released a study that focused on the need for a new Fraser River crossing. Amtrak *Cascades* passenger trains represent only a small percentage of the rail traffic using the bridge. Several freight railroads serving the Vancouver, BC area cross the structure an average of forty to fifty times per day. Initial concepts to address this bottleneck include a new lift-span bridge or a tunnel. Initial ideas to pay for such an expensive project include charging a toll on each train using the new bridge or tunnel. The economics of freight transport are different from the economics of passenger transport. Passenger transportation may not be able to sustain a toll of the magnitude required to construct a new Fraser River crossing.

While the study did not call for the replacement of the bridge for operational reasons, the bridge will eventually need to be modified or replaced to ensure its structural integrity. However, it could take many, many years to secure the financing, complete the environmental documentation, and complete construction. If Amtrak *Cascades* trains no longer had to use the current or the future bridge or tunnel, more daily trains could be



The New Westminster rail bridge (foreground) is at a low level and must be opened frequently for marine traffic. The Patullo highway bridge (immediately behind) and the SkyTrain bridge (background) were constructed high enough above the water to allow marine traffic to pass unobstructed.

added between Seattle and Vancouver, BC before the structure is modified or replaced. The potential toll to use the bridge would not have to be paid by Amtrak, WSDOT, or Amtrak *Cascades* customers.

Better regional access and increased ridership

A Greater Vancouver, BC Terminal would be situated in the center of the Greater Vancouver Regional District. The district is comprised of several municipalities with a total population of nearly two million residents. **Exhibit E-2** lists the most populous of these municipalities based on 2001 Census data from Statistics Canada.

For this plan, ridership forecasts were developed for both Pacific Central Station and a Greater Vancouver terminal located along the Fraser River in Surrey. It is estimated that a Greater Vancouver, BC terminal would increase total annual Amtrak *Cascades* ridership between Seattle and Vancouver, BC

Exhibit E-2
Population in Greater Vancouver, BC Area

MUNICIPALITY	POPULATION
Vancouver	545,500
Surrey	348,000
Burnaby	194,000
Richmond	164,000
Coquitlam	113,000
Langley	110,500
Delta	95,500
District of North Vancouver	82,000
Maple Ridge	55,000
New Westminster	54,500
North Vancouver	44,000
Other Municipalities	94,000
TOTAL	1,900,000

by three to seven percent when the maximum levels of passenger rail service identified WSDOT's long-range plan are in place by 2023.³

³*Direct ridership comparisons between Pacific Central Station and the Greater Vancouver Terminal were only conducted for the scenario that includes five daily Amtrak Cascades roundtrips between Seattle and Vancouver, BC and fourteen daily round trips between Seattle and Portland, OR. The range of values listed here includes an estimate of ridership at the*

This ridership increase would be the result of shorter travel times to and from the new terminal for people residing throughout the region. **Exhibit E-3** illustrates the results of these ridership projections.

Exhibit E-3
Projected Passenger Volumes at Vancouver, BC Stations

2023 PASSENGER VOLUME		
Pacific Central Station	Greater Vancouver Terminal (South Westminster)	Difference
711,000	763,000	7.3%

Note: assumes five daily round trips between Seattle and Vancouver, BC and fourteen daily round trips between Seattle and Portland, OR.

Integration with the proposed South Westminster Neighbourhood Plan

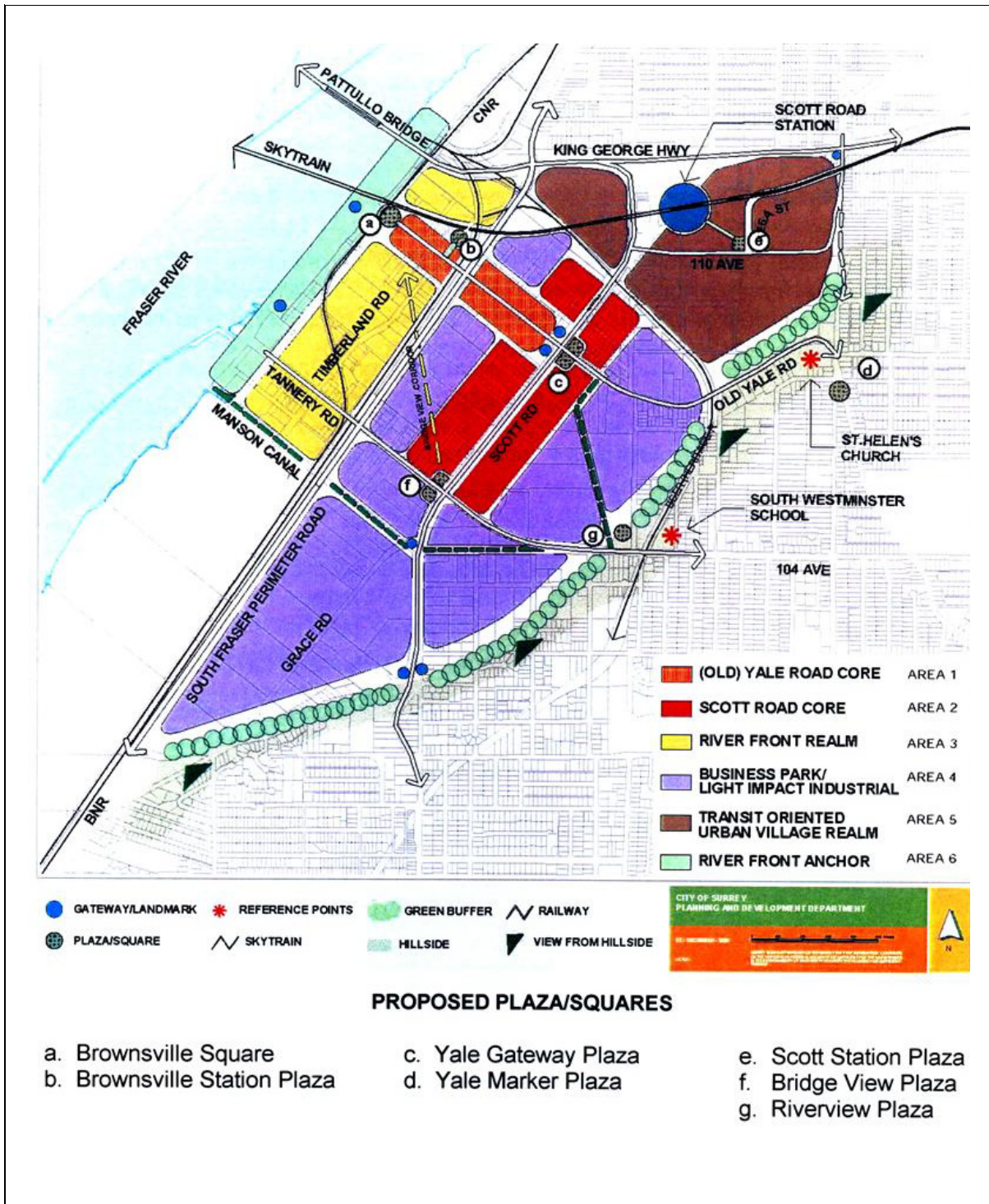
The city of Surrey, British Columbia recently completed a concept plan for the area near the current Scott Road SkyTrain station and the underdeveloped south shore of the Fraser River.⁴ South Westminster is the historic name of the residential area that emerged along the river in the 1890s that also served as the northern terminus of the original rail line that stretched south to Bellingham and the Skagit Valley of Washington. The new neighbourhood plan includes commercial areas, a business park, pedestrian and bicycle corridors, and residential development.

The city of Surrey has expressed interest in including an Amtrak *Cascades* intercity rail terminal adjacent to the new South Westminster development, with the anticipation that the surge in rail passengers converging on the area could further support the economic vitality envisioned in the neighborhood plan. **Exhibit E-4** illustrates this plan.

Greater Vancouver Terminal with four daily round trips between Seattle and Vancouver, BC, and thirteen daily round trips between Seattle and Portland, OR.

⁴*A Neighbourhood Concept Plan for South Westminster (2003). Prepared by the city of Surrey Planning and Development Department. Surrey, British Columbia, Canada.*

**Exhibit E-4
South Westminster Neighborhood Plan**



What are the disadvantages of relocating the Amtrak *Cascades*' northern terminus to Surrey, BC?

As evident in many cities around the United States, the resurgence of rail transportation has inspired the renovation of downtown train stations. Suburban train stations that serve as the end point for rail trips located away from the primary commercial business district of a region can have a negative impact on overall ridership, as it requires a shift from one transportation mode (train) to others (transit, automobile) that some travelers destined for the urban core will not find appealing. Amtrak has suggested that in general, ridership can be reduced by as much as fifty percent when downtown-bound travelers know they will have to make a mode switch once they arrive at a suburban terminal. WSDOT's latest ridership projections address the two Vancouver, BC station options specifically, however, and do not support this suggestion. No other data exists to measure the level of customer support for the relocation from Pacific Central Station to a Greater Vancouver, BC Terminal.

Can Amtrak *Cascades* trains serve both Pacific Central Station and a Greater Vancouver terminal?

It is unlikely. This dual-station arrangement will pose a number of challenges. First, the total estimated cost of the projects at and north of the Fraser River climbs to over \$600 million, as it adds the cost of a new station (estimated at \$75 million) and additional tracks at the new station. This scenario eliminates the trade off in total costs that are assumed in the single station concept, which could make it even more difficult to effectively compete for scarce public funds for transportation projects in the greater Vancouver, BC area.

The dual station scenario would also add at least ten minutes to the scheduled running time between Seattle and downtown Vancouver, BC as it would take at least this much time to leave the main line tracks, enter the station, let off passengers, and return to the main line for the journey across the river and into downtown or south to Seattle. This could have a negative impact on ridership, but the degree of the impact is not known at this time.

The final and perhaps most important challenge that would have to be overcome in the two-station scenario deals with Canadian and U.S. federal security protocols. Customs and Immigration agents from both the United States and Canada would have to be positioned at both Pacific Central Station and the Greater Vancouver, BC Terminal, and additional security arrangements would have to be made so that portions of the train would be locked or sealed in such a way as to ensure that all passengers are accounted for before crossing the international boundary. While this is technically feasible, previous discussions with officials from what is now known as U.S. Customs and Border Protection indicate that the two-station scenario would

not be acceptable, as it would increase risk of security breaches and drive up staffing costs.

What additional research needs to be performed?

The information included in this plan is based on a thorough understanding of railroad operations in the lower mainland of British Columbia and the type of railroad design that will be necessary to achieve the long-term service goals that have been established for Amtrak *Cascades*. However, as the Amtrak *Cascades* program moves forward, more detailed environmental review of the specific capital projects in British Columbia will be necessary, cost estimates would need to be refined further, and public policy decisions regarding the future of the Fraser River Bridge will need to be considered before any action is taken regarding the relocation of the northern terminus for Amtrak *Cascades*. In addition, a more detailed analysis of the ridership and revenue projections for each of the two station options will be necessary.

One of the key recommendations that emerged for the *Cascades Gateway Rail Study* (2002) was that marketing research of Amtrak *Cascades* passengers and residents of the greater Vancouver region would help identify customer preferences for station locations. The appropriate research would be carefully constructed to represent the current and proposed transportation products rather than only the terminal location alternatives. Analysis of the research results would be an important first step toward discovering the level of popular support for continued use of Pacific Central Station or a new Greater Vancouver, BC Terminal.

Who will decide where the northern terminus for Amtrak *Cascades* should be?

The decisions regarding the continued use of Pacific Central Station or relocation to a Greater Vancouver Terminal will ultimately be made by the Canadian organizations that will be funding the capital projects identified in this document. Amtrak and WSDOT will play a role in these discussions, but the responsibility must lie with Canadian funding partners.

When will a decision have to be made?

The decision regarding the location of the northern terminus for Amtrak *Cascades* will need to be made before Timetable C in this plan is implemented. Decision-makers throughout the greater Vancouver, BC area will need to begin to consider the station location options soon. The level of planning needed to begin implementation of either terminal option could take a decade. Substantially completed planning can be helpful when seeking funds and ensures that when funding does become available, the best course of action can be pursued.

Appendix F

Amtrak Cascades Service Delivery

Amtrak *Cascades* Service Delivery

The Washington State Department of Transportation (WSDOT) works closely with Amtrak and other organizations to offer Amtrak *Cascades* intercity passenger service in the Pacific Northwest. This section describes the service agreements that exist between WSDOT, Amtrak, the BNSF Railway Company (BNSF), and Talgo Incorporated. The purpose of this section is to explain how WSDOT and its partners work together to provide Amtrak *Cascades* service to the people of Washington State on a daily basis.

Amtrak Operating Rights on the BNSF Railway Company

Before 1971, passenger rail service was provided by private railroad companies and regulated by the federal government. Recognizing the important role that passenger rail service played in moving people throughout the growing nation, the federal government required the private railroads to offer service to hundreds of American communities, regardless of the commercial viability of the route. As the popularity of automobile and air travel grew, passenger trains carried fewer and fewer riders.

This trend continued through the 1950s and 60s, and the railways eventually petitioned the federal government for relief from their unprofitable passenger services. In 1971, the federal government granted this request and relieved the private railways of their obligation to maintain passenger rail services across the nation. The National Railroad Passenger Corporation, more commonly known as Amtrak, for American Travel by Track, was created.

Amtrak and the Class I¹ railroads have legally binding operating agreements that govern the joint use of the railroad rights of way by the host railroads and Amtrak. In Washington State, this operating agreement is between Amtrak and BNSF. In brief, the Amtrak/BNSF operating contract includes the following provisions:

- Amtrak's right to use BNSF's railroad;
- The fees Amtrak pays BNSF to use the railroad;
- BNSF's control of Amtrak trains operating on BNSF right of way; and
- Incentive and disincentive payments for individual Amtrak train on-time performance.

¹A Class I railroad is any railroad with annual gross revenues of at least \$260 million, according to the U.S. Department of Transportation. These are the largest long-distance U.S. railroad systems such as Union Pacific-Southern Pacific, Norfolk Southern, CSX, and BNSF.

Amtrak *Cascades* trains operating between Portland, Seattle, and Vancouver, BC are governed by this national Amtrak/BNSF agreement. The fifteen year agreement, signed in 1996, expires in 2011.²

WSDOT's Operating Contract with Amtrak

WSDOT has its own operating contract with Amtrak. This agreement, which is renewed annually, specifies:

- Amtrak's responsibilities for providing high-quality Amtrak *Cascades* service, including staffing, ticketing, and reservation services;
- WSDOT's share of the operating losses incurred by the trains;
- The maximum amount WSDOT will pay Amtrak over a federal fiscal year to operate the service; and
- WSDOT's role in Amtrak *Cascades* marketing efforts, fare structure, scheduling, food service, and other on-board service delivery.

Washington State—through WSDOT—is one of several states that provide operating funds for Amtrak intercity passenger service. The total amount that WSDOT pays Amtrak for Amtrak *Cascades* service has a maximum limit for each contract period, which is necessary because Congress funds Amtrak in single-year increments and the Washington State Legislature only provides operating funds on a two-year (biennial) basis. Currently, there are eight Washington state-supported Amtrak *Cascades* trains. The maximum amount that WSDOT will pay Amtrak for the 2004 federal fiscal year is \$11.7 million. This includes a maximum of \$200,000 for on-time performance and customer satisfaction incentives. An additional \$2.75 million will be provided for the operations of a fourth daily Amtrak *Cascades* round trip between Seattle and Portland, scheduled to begin in July 2006.

How do Amtrak and WSDOT collaborate on service delivery?

The WSDOT/Amtrak operating contract recognizes WSDOT's important role in tailoring Amtrak *Cascades* service to meet the needs of Washington rail passengers. WSDOT determined that an active role in Amtrak *Cascades* service development and implementation would be the best way to maximize the public benefits derived from the substantial investment that state makes in the Amtrak *Cascades* program.

²WSDOT has also entered into a separate contract with BNSF on capital improvements to the corridor, described in Chapter 7 of this document.

Since WSDOT began providing Amtrak with state funds for intercity passenger rail services in 1994, WSDOT and Amtrak have continually collaborated on a number of important things that impact the quality of regional intercity passenger rail service in the Pacific Northwest. Areas of collaboration include:

- Establishing the design criteria for new trainsets to be met by train manufacturers responding to the Amtrak/WSDOT Request for Proposals advertised in 1996;
- The selection of the manufacturer of the new train sets (Talgo, Inc.) in 1996;
- The Amtrak *Cascades* annual fare structure that is designed to maximize ridership and revenues;
- Jointly gathering and analyzing customer feedback; this data is used to develop and implement policies and practices that help ensure customer satisfaction;
- The selection of regional foods and beverages for Amtrak *Cascades* on-board menus;
- The development of on-board signage and publications including the Amtrak *Cascades* route guide and other informational brochures that describe specific elements of the service; and
- Amtrak *Cascades* marketing and promotions.

Customer Satisfaction

One of the key measurements used to determine the quality of Amtrak *Cascades* service delivery is Amtrak's Customer Satisfaction Index (CSI). CSI scores are based on surveys of Amtrak passengers that include questions on train cleanliness, food quality, staff performance, and other key indicators that capture customer perceptions. Amtrak and WSDOT have established the CSI goal for Amtrak *Cascades* to be an average of ninety-one points (out of one hundred) or better for the year. Terms of the contract stipulate that Amtrak must take steps to maintain this score, as well as the incentives Amtrak will receive from WSDOT if successful. The collaboration between Amtrak and WSDOT on many aspects of service delivery has consistently placed Amtrak *Cascades* among the nation's top-ranked routes in Amtrak's entire national system.

WSDOT also gathers customer feedback directly from passengers. Customer comment cards are available in most coach and business class cars on each Amtrak *Cascades* train. The cards ask customers what they liked about their train trip and for any other comments they would like to share with WSDOT. Passengers send these comment cards to WSDOT headquarters in Olympia. This qualitative data—coming directly from Amtrak *Cascades* customers—is shared four times per year with Amtrak management. The data is used to

identify both the good and poor aspect of Amtrak *Cascades* service delivery. WSDOT and Amtrak use this data, as well as the CSI scores, to pinpoint problems and take steps necessary to improve service delivery and ensure a positive customer experience.

Amtrak *Cascades* Marketing

WSDOT and Amtrak are jointly responsible for developing and implementing marketing plans for Amtrak *Cascades* service, and each organization provides funds to carry out the marketing plan.

Marketing Amtrak *Cascades* to the traveling public is an important part of service delivery. The majority of people making intercity trips in western Washington do so using the personal automobile and regional air carriers. Both of these transportation modes have benefited greatly from over fifty years of public investment and are mature systems, while intercity passenger rail service in Washington State has only received limited public funding since the early 1990s. Recognizing this fact, the Washington State Legislature provides funding for Amtrak *Cascades* marketing efforts to develop public support and awareness of the service. Current marketing activities include newspaper, magazine and Internet advertisements, and cooperative promotions with dozens of organizations such as the King County Convention and Visitors Bureau, the Seattle Seahawks and Mariners, and the Portland, Oregon Visitors Association. All of these marketing activities are designed to increase public awareness of the Amtrak *Cascades* program, increase ridership and revenues, and help the service become a viable transportation option for intercity travelers throughout western Washington for years to come.

WSDOT's equipment maintenance contract with Talgo, Inc.

In 1999, WSDOT and Amtrak purchased four new train sets from Talgo, Incorporated.³ In addition to the equipment acquisition, Amtrak and WSDOT entered into an ongoing maintenance contract with Talgo, Inc.

As part of this agreement, Talgo places staff aboard each daily Amtrak *Cascades* route to oversee the equipment, and Talgo also performs regular maintenance on the program's five train sets at its Seattle servicing facility. The equipment maintenance contract between WSDOT and Talgo, Inc. averages \$2.3 million per year. The Washington State Legislature also requires WSDOT to have a train equipment preservation plan for the three Talgo train sets owned by the state of Washington. This plan, and more details on the specific elements of the equipment maintenance contract are included in **Appendix C** of this document.

³A fifth train set, under lease to the state of Oregon by Talgo, Inc., was purchased by WSDOT in 2003.